Celebrating the achievements of
San Diego State University students
in research, scholarship & creative activity
# Table of Contents

Map of SDSU Campus ................................................................. 2
Welcome from the President .................................................. 4
Keynote Speaker ................................................................. 5
Schedule at a Glance .......................................................... 6–8
Awards ............................................................................... 9
Reception and Awards Ceremony ...................................... 11
Presentations Schedule: **Friday** ........................................ 13
  - Session H: Creative and Performing Arts Exhibits ............ 14
  - Session E: Creative and Performing Arts Presentations ........ 14
  - Session A: Oral Presentations .................................. 15
  - Session B: Oral Presentations .................................. 18
  - Session C: Oral Presentations .................................. 21
  - Session D: Oral Presentations .................................. 24
  - Session A: Poster Presentations ............................. 33
  - Session B: Poster Presentations ............................. 37
  - Session C: Poster Presentations ............................. 40
  - Session D: Poster Presentations ............................. 43
  - Session G: Poster Presentations ............................. 46
Presentations Schedule: **Saturday** .................................... 27
  - Session I: Oral Presentations .................................. 27
  - Session J: Oral Presentations .................................. 30
Creative and Performing Arts Presentation **Abstracts** .......... 51
Oral Presentation **Abstracts** ............................................. 57
Poster Presentation **Abstracts** ......................................... 167
Acknowledgments ............................................................ 271
Notes ............................................................................... 277
March 4, 2016

Dear Colleagues and Guests:

Welcome to the 2016 Student Research Symposium at San Diego State University. This ninth annual symposium is a university-wide effort that highlights the outstanding research and creative endeavors that distinguish SDSU. It is an opportunity to celebrate the innovation, academic scholarship and creativity that our undergraduate and graduate students bring to their research and a forum for sharing their discoveries, insights and performances with a broader audience.

More than 550 students are presenting original work that emerged from academic programs across the university. More than 50 awards for excellence will be presented. Ten students whose entries are judged exceptional will represent SDSU at the annual California State University Student Research Competition in May.

Our dedicated faculty and staff have encouraged students in their research and are coordinating this symposium. More than 200 volunteers from our faculty and staff and the greater San Diego community are sharing their time and expertise to evaluate the oral, poster, exhibit and performance presentations. I am grateful for these efforts, which demonstrate SDSU’s commitment to cutting-edge research and creative endeavors.

I hope you will enjoy the symposium and the outstanding collaborative work of our students, faculty and staff. This vibrant exploration of ideas defines us as a leading public research university.

With best regards,

Elliot Hirshman, President
Dr. Guadalupe X. Ayala
Associate Dean for Research
College of Health and Human Services
San Diego State University

Dr. Guadalupe X. Ayala is the Associate Dean for Research in the College of Health and Human Services, Professor in the Graduate School of Public Health and Director of the Institute for Behavioral and Community Health, a non-profit research institute dedicated to addressing Latino and other health disparities.

Dr. Ayala completed her PhD in Clinical Psychology with a specialization in Behavioral Medicine in 2002, an MPH in Health Promotion in 2002 and an MA in Experimental Psychology in 1997. She joined SDSU as an Assistant Professor in 2005 and was promoted to Professor in 2011.

She has led several intervention and observational studies funded by the National Institutes of Health, the Robert Wood Johnson Foundation’s Healthy Eating Research program, and the Centers for Disease Control and Prevention; total funding to-date as an SDSU Principal Investigator is $16 million. Her work examines a range of factors related to health and well-being in children, adults, and families, including improving access to and consumption of healthy foods by working with small food stores and restaurants, promoting physical activity through community health worker support, and preventing and controlling obesity, diabetes, and asthma through multi-sector, multi-level changes. Her research has produced over 150 peer-reviewed manuscripts.
### Schedule at a Glance

**Thursday, March 3**

**Registration**
1:00 pm – 4:00 pm
Aztec Student Union, Montezuma Lounge

**Friday, March 4**

**Sessions A, B and H**
8:00 am – 4:00 pm
Aztec Student Union, Montezuma Lounge

**Opening Remarks**
8:30 am – 9:00 am
Elliot Hirshman, President, SDSU
Aztec Student Union, Theatre, Room 270

<table>
<thead>
<tr>
<th>Time</th>
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<th>Session Type</th>
<th>Session Title</th>
<th>Presentation Location</th>
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<tbody>
<tr>
<td>9:00 am</td>
<td>H–1</td>
<td>Exhibit</td>
<td>Exhibit Arts</td>
<td>Montezuma Hall</td>
</tr>
<tr>
<td>9:00 am</td>
<td>A–1</td>
<td>Oral</td>
<td>Public Health &amp; Attitudes</td>
<td>Pride Suite</td>
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<tr>
<td></td>
<td>A–2</td>
<td>Oral</td>
<td>Identities &amp; Representations</td>
<td>Park Boulevard</td>
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<tr>
<td></td>
<td>A–3</td>
<td>Oral</td>
<td>Ecology &amp; Environmental Modeling</td>
<td>Tehuano</td>
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<tr>
<td></td>
<td>A–4</td>
<td>Oral</td>
<td>Reading Popular Culture</td>
<td>Aztlan</td>
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<tr>
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<td>A–5</td>
<td>Oral</td>
<td>Urban History and Communities</td>
<td>Metztli</td>
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<td>A–6</td>
<td>Oral</td>
<td>Physics</td>
<td>Templo Mayor</td>
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<tr>
<td></td>
<td>A–7</td>
<td>Oral</td>
<td>Protein Interactions: Fundamentals, Prevention &amp; Relationship to Disease</td>
<td>Visionary Suite</td>
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<tr>
<td></td>
<td>A–8</td>
<td>Oral</td>
<td>Interdisciplinary</td>
<td>Legacy Suite</td>
</tr>
<tr>
<td>9:00 am</td>
<td>A–9</td>
<td>Poster</td>
<td>Flowing Fluids &amp; Sparking Plasmas</td>
<td>Montezuma Hall</td>
</tr>
<tr>
<td></td>
<td>A–10</td>
<td>Poster</td>
<td>Protein &amp; Cell Engineerin</td>
<td>Montezuma Hall</td>
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<tr>
<td></td>
<td>A–11</td>
<td>Poster</td>
<td>Biology of Disease</td>
<td>Montezuma Hall</td>
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<tr>
<td></td>
<td>A–12</td>
<td>Poster</td>
<td>Predicting Space &amp; Time</td>
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<td></td>
<td>A–13</td>
<td>Poster</td>
<td>Water, Toxins, &amp; Health</td>
<td>Montezuma Hall</td>
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<tr>
<td></td>
<td>A–14</td>
<td>Poster</td>
<td>Catalysis 1</td>
<td>Montezuma Hall</td>
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<tr>
<td></td>
<td>A–15</td>
<td>Poster</td>
<td>Childhood Violence</td>
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<td>A–16</td>
<td>Poster</td>
<td>Influence of Culture</td>
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<td></td>
<td>A–17</td>
<td>Poster</td>
<td>Speech, Language &amp; Hearing Sciences</td>
<td>Montezuma Hall</td>
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<td></td>
<td>A–18</td>
<td>Poster</td>
<td>Bilingual Children</td>
<td>Montezuma Hall</td>
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<tr>
<td>11:00 am</td>
<td>B–1</td>
<td>Oral</td>
<td>Ethnicities &amp; Identities</td>
<td>Pride Suite</td>
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<tr>
<td></td>
<td>B–2</td>
<td>Oral</td>
<td>Health &amp; Wellness</td>
<td>Park Boulevard</td>
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<tr>
<td></td>
<td>B–3</td>
<td>Oral</td>
<td>Environment &amp; Public Health</td>
<td>Tehuano</td>
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<tr>
<td></td>
<td>B–4</td>
<td>Oral</td>
<td>Interdisciplinary</td>
<td>Aztlan</td>
</tr>
<tr>
<td></td>
<td>B–5</td>
<td>Oral</td>
<td>Posture, Balance, &amp; Physical Health</td>
<td>Metztli</td>
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<tr>
<td></td>
<td>B–6</td>
<td>Oral</td>
<td>Chemistry for Analysis &amp; Devices</td>
<td>Templo Mayor</td>
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<tr>
<td></td>
<td>B–7</td>
<td>Oral</td>
<td>Kinetics &amp; Catalysis</td>
<td>Visionary Suite</td>
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<td></td>
<td>B–8</td>
<td>Oral</td>
<td>Culture &amp; Health</td>
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<td>Poster</td>
<td>Our Moving Earth</td>
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<td>B–11</td>
<td>Poster</td>
<td>Left Ventricular Assist Devices &amp; Carotid Compression</td>
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<td>B–12</td>
<td>Poster</td>
<td>Molecular Biology</td>
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<tr>
<td></td>
<td>B–13</td>
<td>Poster</td>
<td>Synthetic Chemistry</td>
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<td>B–14</td>
<td>Poster</td>
<td>Caregiver</td>
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<td>Poster</td>
<td>Children's Health</td>
<td>Montezuma Hall</td>
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<tr>
<td></td>
<td>B–16</td>
<td>Poster</td>
<td>Evolution</td>
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<tr>
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<td>B–17</td>
<td>Poster</td>
<td>Marine Microbiology</td>
<td>Montezuma Hall</td>
</tr>
<tr>
<td></td>
<td>B–18</td>
<td>Poster</td>
<td>Construction, Damaged Materials, &amp; WrestleBrainia</td>
<td>Montezuma Hall</td>
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</table>
# Schedule at a Glance

**Friday, March 4 Sessions C, D, E and F**

8:00 am – 4:00 pm  
Registration  
Aztec Student Union, Montezuma Lounge

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Number</th>
<th>Session Type</th>
<th>Session Title</th>
<th>Presentation Location</th>
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<tbody>
<tr>
<td>1:30 pm</td>
<td>E–1</td>
<td>Creative Arts</td>
<td>Visual, Performing, Creative Arts &amp; Design I</td>
<td>Montezuma Theatre</td>
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<tr>
<td>1:00 pm</td>
<td>C–1</td>
<td>Oral</td>
<td>Autism</td>
<td>Pride Suite</td>
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<tr>
<td></td>
<td>C–2</td>
<td>Oral</td>
<td>Faculty, Students, Identity &amp; Behavior</td>
<td>Park Boulevard</td>
</tr>
<tr>
<td></td>
<td>C–3</td>
<td>Oral</td>
<td>Higher Education: Teaching &amp; Learning</td>
<td>Tehuano</td>
</tr>
<tr>
<td></td>
<td>C–4</td>
<td>Oral</td>
<td>Interdisciplinary</td>
<td>Aztlán</td>
</tr>
<tr>
<td></td>
<td>C–5</td>
<td>Oral</td>
<td>Computational Methods in Aerospace &amp; Mechanical</td>
<td>Metztli</td>
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<tr>
<td></td>
<td>C–6</td>
<td>Oral</td>
<td>Political Theory, Opinion, &amp; Identity</td>
<td>Templo Mayor</td>
</tr>
<tr>
<td></td>
<td>C–7</td>
<td>Oral</td>
<td>Books, Comics, &amp; Digital Humanities</td>
<td>Visionary Suite</td>
</tr>
<tr>
<td></td>
<td>C–8</td>
<td>Oral</td>
<td>Communication, Learning &amp; Health</td>
<td>Legacy Suite</td>
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<tr>
<td>12:30 pm</td>
<td>C–9</td>
<td>Poster</td>
<td>Analytical Chemistry</td>
<td>Montezuma Hall</td>
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<td></td>
<td>C–10</td>
<td>Poster</td>
<td>Stress</td>
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<td>C–11</td>
<td>Poster</td>
<td>Let’s Take Care of Our Water &amp; Soil!</td>
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<tr>
<td></td>
<td>C–12</td>
<td>Poster</td>
<td>Sociology</td>
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<tr>
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<td>C–13</td>
<td>Poster</td>
<td>Nursing</td>
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<td>C–14</td>
<td>Poster</td>
<td>Physical Therapy</td>
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<td>C–15</td>
<td>Poster</td>
<td>Balance</td>
<td>Montezuma Hall</td>
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<td>C–16</td>
<td>Poster</td>
<td>Business</td>
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<td>C–17</td>
<td>Poster</td>
<td>Hispanic Health Issues</td>
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<tr>
<td>3:00 pm</td>
<td>D–1</td>
<td>Oral</td>
<td>Cell Biology, Microbiology &amp; Virology</td>
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<tr>
<td></td>
<td>D–2</td>
<td>Oral</td>
<td>Marine Biology</td>
<td>Park Boulevard</td>
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<td></td>
<td>D–3</td>
<td>Oral</td>
<td>oral Health</td>
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<td></td>
<td>D–4</td>
<td>Oral</td>
<td>Interdisciplinary</td>
<td>Aztlán</td>
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<td>D–5</td>
<td>Oral</td>
<td>Ancient Cultures</td>
<td>Metztli</td>
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<td></td>
<td>D–6</td>
<td>Oral</td>
<td>Identity, Gender and Performance</td>
<td>Templo Mayor</td>
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<tr>
<td></td>
<td>D–7</td>
<td>Oral</td>
<td>Philosophy: Metaphysics, Ethics &amp; Continental</td>
<td>Visionary Suite</td>
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<td>D–8</td>
<td>Oral</td>
<td>Communication, Place, &amp; Health</td>
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<td>D–9</td>
<td>Poster</td>
<td>Medical Biotechnology</td>
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<td>Poster</td>
<td>Alcohol &amp; Tobacco</td>
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<td>D–11</td>
<td>Poster</td>
<td>Big Data Biology</td>
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<td>D–12</td>
<td>Poster</td>
<td>Health &amp; Alternative Medicine</td>
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<td></td>
<td>D–13</td>
<td>Poster</td>
<td>Engineering</td>
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<td>D–14</td>
<td>Poster</td>
<td>Meeting the Challenge</td>
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<td>D–15</td>
<td>Poster</td>
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<td>D–16</td>
<td>Poster</td>
<td>San Diego County</td>
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<td>D–17</td>
<td>Poster</td>
<td>Gender, Race, &amp; Behavior</td>
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Friday continued, Saturday
## Friday, March 4  **Session G**
8:00 am – 4:00 pm  Registration  Aztec Student Union, Montezuma Lounge

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<tr>
<td>4:00 pm</td>
<td>G–1</td>
<td>Poster</td>
<td>Medical Microbiology</td>
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<td>G–2</td>
<td>Poster</td>
<td>Antennas</td>
<td>Montezuma Hall</td>
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<td>G–3</td>
<td>Poster</td>
<td>Applied Biochemistry</td>
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<td>G–4</td>
<td>Poster</td>
<td>Perception</td>
<td>Montezuma Hall</td>
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<td>G–5</td>
<td>Poster</td>
<td>Disparities: Health &amp; Income</td>
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<td>G–6</td>
<td>Poster</td>
<td>Alzheimer’s &amp; Memory</td>
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<td>D–7</td>
<td>Poster</td>
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<td>Montezuma Hall</td>
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<td>G–8</td>
<td>Poster</td>
<td>Water Biology</td>
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<td>G–9</td>
<td>Poster</td>
<td>Hot Topics in Flames and Solar Energy</td>
<td>Montezuma Hall</td>
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## Saturday, March 5  **Sessions I and J**
8:00 am – 10:00 am  Registration  Aztec Student Union, Montezuma Lounge

<table>
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<tr>
<td>9:00 am</td>
<td>I–1</td>
<td>Oral</td>
<td>Tinker Group 1</td>
<td>Pride Suite</td>
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<td>I–2</td>
<td>Oral</td>
<td>Mechanical &amp; Bioengineering</td>
<td>Park Boulevard</td>
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<tr>
<td></td>
<td>I–3</td>
<td>Oral</td>
<td>Binge Eating &amp; Juvenile Health</td>
<td>Tehuanco</td>
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<tr>
<td></td>
<td>I–4</td>
<td>Oral</td>
<td>Migration, Identity, &amp; Higher Education</td>
<td>Aztlán</td>
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<td>I–5</td>
<td>Oral</td>
<td>Borderlands &amp; Communities</td>
<td>Metztli</td>
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<td>I–6</td>
<td>Oral</td>
<td>Ecology &amp; Evolutionary Biology</td>
<td>Templo Mayor</td>
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<td>I–7</td>
<td>Oral</td>
<td>Philosophy: God, Ethics, &amp; Beauty</td>
<td>Visionary Suite</td>
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<tr>
<td></td>
<td>I–8</td>
<td>Oral</td>
<td>Astronomy &amp; Stars</td>
<td>Legacy Suite</td>
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<tr>
<td>11:00 am</td>
<td>J–1</td>
<td>Oral</td>
<td>Tinker Group 2</td>
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<td>Perceptions, Identity, Self-Esteem &amp; Stereotypes</td>
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<td>J–3</td>
<td>Oral</td>
<td>Neural &amp; Motor Biology</td>
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<td>Oral</td>
<td>Linguistics &amp; Archaeology</td>
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<td>J–5</td>
<td>Oral</td>
<td>Interdisciplinary</td>
<td>Metztli</td>
</tr>
<tr>
<td></td>
<td>J–6</td>
<td>Oral</td>
<td>Drug Use &amp; Cancer</td>
<td>Templo Mayor</td>
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**12:00 – 1:30 pm**  **Lunch Reception**  Aztec Student Union, Goldberg Courtyard

**2:00 – 3:00 pm**  **Keynote Address and Awards Ceremony**  Aztec Student Union, Montezuma Hall

**Keynote Speaker:**
Dr. Guadalupe X. Ayala  
Associate Dean for Research  
College of Health and Human Service
Awards will be presented at the Ceremony on Saturday, March 5, to recognize the most outstanding presentations of research, scholarship, and creative activity at the Student Research Symposium. The awards are as follows:

**President’s Awards for Research**
President’s Awards of $500 will be given to the ten outstanding presentations in discipline-specific categories. Those receiving a President’s Award will represent SDSU at the California State University (CSU) Student Research Competition on April 29th and 30th, 2016, at CSU, Bakersfield.

**President’s Award for the Arts**
A President’s Award of $500 will be given to the outstanding presentation in the performance arts or exhibit category.

**Provost’s Awards**
Several Provost’s Awards ($150) for outstanding poster presentations will be selected from all poster entries shown at the Symposium.

**Dean’s Awards**
Dean’s Awards of $250 each will be given for oral presentations. Awards will go to the top presentations in each college. One award will go to the top presentation from the Imperial Valley Campus.

**Scholars Without Borders/International Award**
Scholars Without Borders is an honorary society dedicated to promoting international exchange and service and recognizing scholarly achievement in an international context. This award provides an additional $100 award for presenters who receive President’s or Dean’s award for work conducted internationally.

**The Charles Wei-hsun Fu Foundation Award for Research in Philosophy**
The Department of Philosophy will award $500 to the best oral presentation in Philosophy.

**Library Awards**
Several awards from the Library of $250 each (both undergraduate and graduate) will be given for the best projects using library resources and collections, including, but not limited to, printed resources, databases, primary resources, and materials in all media.

**Undergraduate Research Excellence Awards**
Several undergraduate research will each receive $150 in recognition of their scholarly achievement. These students will be selected from both oral and poster presentations.

**Outstanding Compact Scholar Researcher Award**
$250 will be awarded to the student with the highest oral or poster presentation score completed by an undergraduate researchers who is also a member of the Compact Scholars Program. Compact Scholar eligibility must be verified before the award is issued.

**Research Awards for Diversity, Inclusion, and Social Justice**
Diversity, social justice, and inclusiveness reflect some of the values at the core of our university mission. Four $250 awards will be presented jointly by the Chief Diversity Officer, the Division of Graduate and Research Affairs,
and the Division of Undergraduate Studies for the two best undergraduate and two best graduate student research presentations that exemplify our ongoing commitment to diversity, inclusion, and social justice.

**Women in Engineering Awards**
SpaceMicro Inc. will award $250 and $150 for the two best engineering presentations by women.

**Creative and Performing Arts Awards**
In addition to the President’s Award for the Arts, other creative and performing arts awards are under development and will be announced at the event.

**Common Experience Theme Award**
An award will be given out to an exemplary poster or oral presentation which deals with this year’s Common Experience Theme which is Energy. The Common Experience, under the Division of Undergraduate Studies, helps increase interactions between faculty staff and students though a focus on a common timely and relevant theme.

**A Note About The Awards**
Students receiving one award will not be considered for additional awards unless otherwise specified.
Saturday, March 5, 2016

Reception: 12:00 pm – 1:30 pm, Aztec Student Union, Goldberg Courtyard

Keynote Address and Awards Ceremony: 2:00 – 3:00 pm, Aztec Student Union, Montezuma Hall

Saturday afternoon events are open to all student presenters, mentors, and judges.

Awards Ceremony
2016 Student Research Symposium

Welcome

Keynote Address

Awards *

Undergraduate Research Excellence Awards
Common Experience Theme Award
Outstanding Compact Scholar Researcher Award
Research Awards for Diversity, Inclusion and Social Justice
Philosophy Award

Library Awards

Women in Engineering Awards brought to you by SapceMacro, Inc.

Awards for Outstanding Creative & Performing Arts

Deans Awards

Provost’s Awards

President’s Awards

Closing Remarks

* Photos will be taken of each recipient as they receive the award.
Group photos will be taken immediately after the ceremony.
Recipients are encouraged to stay for group photos.
Creative Arts Exhibits and Presentations

Friday, March 4, 2016
Sessions H and E

An asterisk at the beginning of a presentation title denotes an exhibit, poster or talk that uses the SDSU common experience theme of Energy.

Energy is defined as human energy, mechanical energy or creative energy.
Friday, March 4, 2016

Session H: Creative Arts Exhibits

Session H-1
Arts Exhibit:
Visual Creative Arts
Friday, March 4, 2016, 9:00 am
Location: Montezuma Hall

628 9:00 am
(in)visibility
Molly Gabbard, Applied Design (M)

629 9:00 am
Secret Words
Kaitlyn Fusco, Studio Art (U)

630 9:00 am
Girl with Flower
Danni Bao, Art (U)

631 9:00 am
Caesurae
Kaiya Rainbolt, Art (M)

632 9:00 am
*Tactus Veritas—Touch Reality
Charlene Mosley, Studio Arts (U)

633 9:00 am
*What’s Your Credit Score?
Moses Muturi, Art (M)

Session E: Creative Arts Presentations

Session E-1
Performing Arts:
Visual, Performing, Creative Arts & Design
Friday, March 4, 2016, 1:30 pm
Location: Montezuma Theatre

634 1:30 pm
*Contact Improvisation: Moving Bodies Move Ideas
Nhu Nguyen, Dance (U)

635 1:50 pm
Not Just a Dancer: Vocal Warm Ups for the “Dancer Who Sings”
Jessica Humphrey, Musical Theatre (M)

636 2:10 pm
The Strategy of Songwriting: Demonstrating Musical Influences in Just Pretend—a New Musical
Bradley J. Behrmann, Theatre Arts in Musical Theatre (M)

637 2:30 pm
“I Believe in You”: Choosing Audition Material in Musical Theatre
Kikau Alvaro, Musical Theatre MFA (M)

638 2:50 pm
Meeting Mrs. Tottendale
Julia Cuppy, Musical Theatre (M)

639 3:10 pm
From Jukebox to Musical
Liv Stevns Petersen, Musical Theatre (M)

640 3:30 pm
La Bamba Moderna: Making Traditional Music Relevant to Young Audiences
Gustavo Alcoser, Latin American Studies (M)

Please turn off all cell phones and other devices.

Student Level: (U)=Undergraduate; (M)=Masters; (D)=Doctoral

Poster presenters are required to stand by their poster during the entire 1-hour and 30 minute discussion period. Each oral presentation is allotted 10 minutes followed by a 5-minute question and answer period. Participants and guests are asked to enter or leave the rooms only between presentations.
Oral Presentations

Friday, March 4, 2016
Sessions A, B, C and D

Saturday, March 5, 2016
Sessions I and J

An asterisk at the beginning of a presentation title denotes an exhibit, poster or talk that uses the SDSU common experience theme of Energy.

Energy is defined as human energy, mechanical energy or creative energy.
Friday, March 4, 2016
Session A: Oral Presentations

Session A-1
Oral Presentation: Public Health & Attitude
Friday, March 4, 2016, 9:00 am
Location: Pride Suite

100 9:00 am
Stigma towards addicts of different substances: A path analytic approach
Nathan Echols, Psychology (U)

101 9:15 am
Social Change Index (SCI)
Trisha Hall, Hospitality and Tourism Management (M)

102 9:30 am
Relationships Among Trauma, PTSD, Mental Health, and Parental Alcohol Use Patterns to BAC in Female DUI Offenders
Tamara Strohauer, Social Work (M)

103 9:45 am
The Role of Attitudinal Ambivalence in the Relationship between E-Cigarette Messages and E-Cigarette Benefit and Harm Perceptions
Anuja Majmundar, Communication (M)

104 10:00 am
Drug Avoidance Self-Efficacy among Cannabis-Only Users and Other Drug Users Who Visit the Emergency Department
Sarah Clingan, Substance Use (D)

411 10:15 am
Examining the Relationship of Racism to African American Acculturation and Social Desirability
Konnor McMillen, Psychology (U)

Session A-2
Oral Presentation: Identities & Representations
Friday, March 4, 2016, 9:00 am
Location: Park Boulevard

105 9:00 am
Spoken But Not Heard: The Role of Pragmatics in SMS Communication
Hari Buenfil, Linguistics (U)

106 9:15 am
Music and Social Justice: Examining the Effect Music has on Sustainable Behavior
Linda Murillo, Social Work (U)

107 9:30 am
International Norms and the Woman’s Voice
Leah Schroeder, International Security & Conflict Resolution (U)

108 9:45 am
Doppelgängers: Their Impact on Creative Works and Our Real Lives
Madeline Barnes, Humanities (U)

109 10:00 am
*Is the Medium the Message in Political Organization Public Relationships?*
Kalyca Becktel, Public Relations (U)

110 10:15 am
“Bring someone new and dance for free!”: Survival of Post-Modern Balkan Folk Dance Villages
Jasmine Arpagian, Geography (D)

111 9:00 am
Safa Ismail, Biology (U)

113 9:15 am
Screening for Indicator Species of Changing Coral Benthic Communities
John Haggerty, Ecology (D)

114 9:30 am
The power of microbes: Microbial bioenergetics of coral-algal interactions
Ty Roach, Cell and Molecular Biology (D)
<table>
<thead>
<tr>
<th>Session A-4</th>
<th>Oral Presentation: Reading Popular Culture</th>
</tr>
</thead>
<tbody>
<tr>
<td>115 9:45 am</td>
<td>From DNA to FBA: how to build your own genome-scale metabolic model</td>
</tr>
<tr>
<td>Daniel Cuevas, Computational Science (D)</td>
<td></td>
</tr>
<tr>
<td>116 10:00 am</td>
<td>Supershear Transition Analysis in 3D Rough Fault Dynamic Simulations</td>
</tr>
<tr>
<td>Qian Yao, Geological Sciences (D)</td>
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</tr>
</tbody>
</table>

**Session A-4**

**Oral Presentation:** Reading Popular Culture

**Friday, March 4, 2016, 9:00 am**

**Location:** Aztlan

| 117 9:00 am | THE STORY IS THAT THERE IS NO STORY: Media Framing of Synthetic Biology and Its Ethical Implications as Nonissues in the New York Times (2005–2015) |
| Yi-Lin Chung, Sociology (U) |
| 118 9:15 am | Fusion Carnivalesque—the Semiotics of Gender Play in Steven Universe |
| Susan Shamoon, Children’s Literature (M) |
| 119 9:30 am | “Manhattan” Shaping Public Memory: The Television Show “Manhattan” presented as a Public Memory Site |
| Ana Aguilá, English and Comparative Literature (M) |
| 120 9:45 am | She’s So Unusual: Women Self-fashioning as Artists and Changing the Dialogue on MTV |
| Sherry Boulter, History (M) |
| 121 10:00 am | Girls Are as Surfing Is: Representation and Negotiation of Women in Surf Magazines |
| Jasmine Tocki, History (M) |
| 122 10:15 am | *Deconstruction of the Cuento: Subversive Language in Three Short Stories by Luisa Valenzuela.* |
| Magdalena Padilla, Spanish (M) |

**Session A-5**

**Oral Presentation:** Urban History and Communities

**Friday, March 4, 2016, 9:00 am**

**Location:** Metztli

| 123 9:00 am | The Impact of World War II on Italian Americans |
| Alyssa Moscrop, Political Science (U) |
| 124 9:15 am | San Diego Boosterism and Robert “Bob” Wilson |
| Stephen Dichera, History (U) |
| 125 9:30 am | “Busiest Man on Campus”: Lorenzo Madalena’s San Diego State Connections |
| Lillian Glenister, Journalism (U) |
| 126 9:45 am | “Guttural German”: Herbert Marcuse, the Media, and Student Radicalism in San Diego During the 1960s |
| Beau Bennett, History (M) |
| 127 10:00 am | Craft Beer in San Diego: A Consumable’s Effect on a City’s Identity and Landscape |
| Lindsay Lehnhoff, History (M) |

**Session A-6**

**Oral Presentation:** Physics

**Friday, March 4, 2016, 9:00 am**

**Location:** Templo Mayor

<p>| 128 9:00 am | <em>Al/SiO2 Metamaterial Microdisks with Hyperbolic Dispersion</em> |
| Grant Varnau, Physics (U) |
| 129 9:15 am | Improved Numerical Projection of Angular Momentum |
| Kevin O’Mara, Physics (U) |
| 130 9:30 am | <em>Generation and detection of first order polar vector beams using a segmented Q plate with q=1/2</em> |
| Sam Delaney, Physics (U) |</p>
<table>
<thead>
<tr>
<th>Time</th>
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</tr>
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<tbody>
<tr>
<td>9:45 am</td>
<td>Single Beam Gradient Force Optical Trapping Applied in Biological Systems</td>
<td>James Heller, Physics (U)</td>
</tr>
<tr>
<td>10:00 am</td>
<td>Localizing 3D Positron Emission Tomography Scintillation Events</td>
<td>Dennis Seely, Physics (M)</td>
</tr>
<tr>
<td>10:15 am</td>
<td>Generation of selective states of polarization using a diffraction grating encoded onto a spatial light modulator</td>
<td>Katherine Badham, Physics (M)</td>
</tr>
<tr>
<td>9:00 am</td>
<td>Solution binding studies of Drosophila melanogaster UNC-45 protein</td>
<td>Perla Pena Palomino, Chemistry/Biochemistry (U)</td>
</tr>
<tr>
<td>9:15 am</td>
<td>Metal Cations to Control Electroosmotic Flow in Capillary Electrophoresis</td>
<td>Shane Wells, Chemistry (U)</td>
</tr>
<tr>
<td>9:30 am</td>
<td>Synthesis and Biochemical Evaluation of Axially Chiral Terephthalamide Derivatives as Selective $\alpha$-Helix Mimic Inhibitors of Protein-Protein Interactions</td>
<td>Arianna Ayonon, Chemistry (U)</td>
</tr>
<tr>
<td>9:45 am</td>
<td>Selective Synthesis of Phosph(on)ate Esters using Diazoaalkanes Generated In Situ</td>
<td>Breanna Canter, Chemistry (U)</td>
</tr>
<tr>
<td>10:00 am</td>
<td>Probing the Molecular Mechanism of IDH1 Tumorigenic Mutations</td>
<td>Diego Avellaneda Matteo, Chemistry (M)</td>
</tr>
<tr>
<td>9:00 am</td>
<td>Quantifying the Effects of Santa Ana Winds on Wildfires</td>
<td>Logan Kiff, Mechanical Engineering (M)</td>
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<tr>
<td>9:15 am</td>
<td>Evaluating the Efficiency of Curve Speed Warning Interfaces on Drivers' Performance in the Vehicle-to-Infrastructure (V2I) Network, a Simulator Study</td>
<td>Alidad Ahmad, Transportation (M)</td>
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<td>9:30 am</td>
<td>Visitor Activities and Awareness of Marine Protected Areas And Species Composition at Rocky Intertidal Sites in San Diego, CA</td>
<td>Monica Tydlaska, Biology (M)</td>
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<td>9:45 am</td>
<td>Predicting streamflow variables for the US using regional regression models</td>
<td>Geoffrey Fouad, Geography (D)</td>
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<tr>
<td>10:00 am</td>
<td>Terrigenous Sediment Dynamics in a Small, Tropical Fringing-Reef Embayment, American Samoa</td>
<td>Alex Messina, Geography (D)</td>
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<tr>
<td>10:15 am</td>
<td>Assessing postfire recovery of chamise chaparral based on multitemporal Landsat SVI trajectories</td>
<td>Emanuel Storey, Geography (D)</td>
</tr>
<tr>
<td>11:00 am</td>
<td>Border Stories: Are Immigration Attitudes Shaped by Fear?</td>
<td>Kelliah Federman, Political Science (U)</td>
</tr>
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**Session A-8**

**Oral Presentation:** Interdisciplinary  
Friday, March 4, 2016, 9:00 am  
Location: Legacy Suite

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<td>Terrigenous Sediment Dynamics in a Small, Tropical Fringing-Reef Embayment, American Samoa</td>
<td>Alex Messina, Geography (D)</td>
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<td>145</td>
<td>Assessing postfire recovery of chamise chaparral based on multitemporal Landsat SVI trajectories</td>
<td>Emanuel Storey, Geography (D)</td>
</tr>
</tbody>
</table>

**Session B: Oral Presentations**

**Session B-1**

**Oral Presentation:** Ethnicities & Identities  
Friday, March 4, 2016, 11:00 am  
Location: Pride Suite

<table>
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<tr>
<th>Time</th>
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<td>Border Stories: Are Immigration Attitudes Shaped by Fear?</td>
<td>Kelliah Federman, Political Science (U)</td>
</tr>
</tbody>
</table>
147 11:15 am  
**From Shackles to Jumpsuits: A Racial Critique of ‘Orange is the New Black’**  
Samantha Davies, Health Communication (U)

148 11:30 am  
**Being Latina: Perception vs. Reality**  
Rosa Valencia, Philosophy (U)

149 11:45 am  
**The Subtle Genocide of the Indigenous People**  
Vicky Madera, International Security & Conflict Resolution (U)

150 12:00 pm  
**Restorative Justice and Care Ethics: A Coalition for the Transformation of the Legal System**  
Alicia Montellanos, Philosophy (M)

151 12:15 pm  
**Reclaiming Indigenous Identity: Coping with Stigmatization and Discrimination in School**  
Ana Gabriela Kovats, Education (D)

**Session B-2**  
**Oral Presentation:** Health & Wellness  
Friday, March 4, 2016, 11:00 am  
Location: Park Boulevard

152 11:00 am  
**Differences in spatial memory among young, middle-aged, and older adults may depend on the level of interference: Evidence for less efficient pattern separation in older adults**  
Shannon DeJesus, Psychology (U)

153 11:15 am  
**Can Non-Hazardous Landfills Be Bad for Your Health? An Examination of Their Effects on Neighboring Communities**  
Lillian Hernandez, Environmental Science (U)

154 11:30 am  
**An Evaluation of Wellness Program Participation at the La Jolla Institute**  
Emily Seymour, Public Health (M)

155 11:45 am  
**Factors Associated with Poor Provider-Patient Communication among Medicare Beneficiaries with a Usual Source of Care**  
Jenan Madbak, Social Work/Public Health (M)

157 12:00 pm  
**Expiratory Flow Limitation, Dynamic Hyperinflation, and Locomotor Power and Fatigue**  
Jonathan Cunha, Exercise Physiology and Nutritional Sciences (M)

**Session B-3**  
**Oral Presentation:** Environment & Public Health  
Friday, March 4, 2016, 11:00 am  
Location: Tehuanco

158 11:00 am  
**Food Security and Gender Analysis: Tanzania, Ghana, and Ethiopia**  
Kayla Magana, Communication (U)

159 11:15 am  
**Genetic Disposition in PTC Taste Status and Beer Bitterness and Pleasantness Perceptions**  
Tawny Whaley, Psychology (U)

160 11:30 am  
**Calcium Supplement Intake and Bone Health in the Elderly: Awareness and Perception of Risk in the San Diego Geriatric Population**  
Joy Gao, Nursing (U)

161 11:45 am  
**Awareness of Lead Poisoning Among Recent East African Immigrants: A Case Study of San Diego’s City Heights Community**  
Rodgers Bwayo, Health Science (U)

162 12:00 pm  
**Bangladesh and India: the escalating political and environmental crisis in the region of Bengal**  
Fernando Gutierrez Ladron de, Exchange student, Business Administration/Theatre Arts (U)

163 12:15 pm  
**Examining ambient pm2.5, pm1.0 and black carbon personal exposure in nine locations throughout Mumbai during the winter season**  
Fred Rueger, Environmental Health (M)
Session B-4

**Oral Presentation:** Interdisciplinary

Friday, March 4, 2016, 11:00 am

Location: Aztlan

164 11:00 am

**Building a Combat Robot: The Design and Research Stages**
Charles Joseph Casabar, Electrical (U)

165 11:15 am

**Examining Food Waste Within a College Campus: Student Perceptions and Attitudes Towards On-Campus Dining Sustainability**
Karly Salcido, Speech, Language, and Hearing Sciences (U)

166 11:30 am

**Automatic Detection and Classification of Toothed Whale Echolocation Clicks in Diverse Long Term Recordings**
Scott Lindeneau, Computer Science (M)

167 11:45 am

**Enhanced Security Risks Due to International Disaster Response/Recovery Gaps**
Jamie Mott, Homeland Security (M)

168 12:00 pm

**Underwater Probes**
Jeffrey Sadural, Computer Science (M)

169 12:15 pm

**Unsupervised Identification of Toothed Whales from Echolocation Clicks**
Yun Trinh, Computer Science (M)

Session B-5

**Oral Presentation:** Posture, Balance, & Physical Health

Friday, March 4, 2016, 11:00 am

Location: Metztli

170 11:00 am

**Maturation of postural sway is influenced by gender but not by body mass index**
Christina Frenchik, Pre-Physical Therapy (U)

171 11:15 am

**Postural control deficits in Division I athletes: the first 48 hours following mild concussions**
Selena Mae Soria, Pre-Physical Therapy (U)

172 11:30 am

**Implementation of BTrackS for assessment of balance in individuals with stroke**
Carly Graff, Kinesiology, Pre-Physical Therapy (U)

173 11:45 am

**Dual-tasking inhibits postural control in older adults**
Brad Taylor, Clinical Psychology (M)

174 12:00 pm

**An effective exercise intervention to improve physical function in community-dwelling older adults**
Katie Thralls, Health Behavior (D)

175 12:15 pm

**Y-Balance Test as a Predictor of Running-Related Injuries in High School Cross-Country Athletes**
Natalie Ruffe, Physical Therapy (D)

Session B-6

**Oral Presentation:** Chemistry for Analysis & Devices

Friday, March 4, 2016, 11:00 am

Location: Templo Mayor

177 11:00 am

**Interface Chemistry Between Glassy Carbon and Polyimide**
Kyle Logan, Chemistry (U)

178 11:15 am

**Sample Encapsulation Post Electrophoretic Separation on Microfluidic Platform**
Amy Vo, Chemistry (M)

179 11:30 am

**Enhancement of Solar Cell Activity by the Attachment of Silver Nanoparticles**
Nobuyuki Yamamoto, Chemistry (D)

180 11:45 pm

**Substituent Effects on Fluorescent, Tricyclic Cytidine Analogues**
Dillon Burns, Chemistry (D)
Session B-7

Oral Presentation: Kinetics & Catalysis
Friday, March 4, 2016, 11:00 am
Location: Visionary Suite

181 11:00 am
Unraveling tumorigenesis: How the kinetics of mutant IDH alter the tumor microenvironment
Eric Gonzalez, Biochemistry (U)

182 11:15 am
*Ab initio Kinetic Model for Parallel Addition Reactions of Open-Shell Combustion Intermediates
Pierre Winter, Chemistry (M)

183 11:30 am
*A Highly Selective and Efficient Coordinatively Unsaturated Ruthenium Isomerization Catalyst
Erik Paulson, Chemistry (D)

184 11:45 am
Lewis Base Catalyzed Regioselective Chlorination of Activated Aromatic Small Molecules
Sean Maddox, Chemistry (D)

185 12:00 pm
Kinetic Study of Silver Nanoparticle Synthesis
Sonya Steffens, Chemistry (D)

186 12:15 pm
*Molecular Solutions to the Energy Crisis
Jayneil Kamdar, Chemistry (D)

Session B-8

Oral Presentation: Culture & Health
Friday, March 4, 2016, 11:00 am
Location: Legacy Suite

187 11:00 am
Comparative Analysis of the Healing Magic of Greco-Romans and Post-Contact Mesoamericans
Mark Jones, History (M)

188 11:15 am
Deficiencies in Antigen Presentation in African American Prostate Cancer
Harmony Saunders, Cell and Molecular Biology (M)

189 11:30 am
The Contributions of Acculturation Versus Integration: Assessing Obesity Among Native Hawaiians and Pacific Islanders in San Diego
Adrian Bacong, Public Health (M)

190 11:45 am
Understanding Barriers to Physical Activity Among Native Hawaiian and Pacific Islanders in San Diego, CA
Liki Porotesano, Public Health (M)

191 12:00 pm
When Your Pulse Tells Your Symptoms: Conversation Analysis of Korean Medicine
Taewook Ham, Communication (M)

192 12:15 pm
Cultural Differences in Coping Strategies, Protective Factors, and Trauma Symptoms: Comparing African American, White, and Latino Adolescents
Woo Jung Lee, Psychology (M)

Session C: Oral Presentations

Session C-1

Oral Presentation: Autism
Friday, March 4, 2016, 1:00 pm
Location: Pride Suite

193 1:00 pm
Links between thalamocortical and cerebrocerebellar intrinsic functional connectivity in autism
Michael Berkebile, Psychology (M)

194 1:15 pm
Links between local and long distance functional connectivity in Autism Spectrum Disorder
Sangeeta Nair, Psychological Research (M)

195 1:30 pm
Atypical intrinsic functional connectivity of core face perception system is associated with symptom severity in ASD
Weiqi Zhao, Psychology (M)

196 1:45 pm
Afroz Jahedi, Computation Statistics (D)
Session C-2

**Oral Presentation:**
Faculty, Students, Identity & Behavior
Friday, March 4, 2016, 1:00 pm
Location: Park Boulevard

197 1:00 pm
*The Impact of Faculty Diversity in California Community Colleges on Success of Students of Color*
Oscar Duran, Social Science (U)

198 1:15 pm
*Persistence in the community college: Men of color and engagement with faculty*
Alejandro Arias, Foods & Nutrition (U)

199 1:30 pm
*Faculty as Institutional Agents*
Stephanie Estrada, Urban Studies (U)

200 1:45 pm
*“Because I Said So”: Parenting Styles and the Effects on Silencing, Sensation Seeking, and Risk Behaviors in College Students*
Shane Wehlage, Communication (M)

201 2:00 pm
*The Effects of Disciplinary Fragmentation on the Cultivation of Academic Identity: The Communication Studies Field as an Exemplar*
Courtney Hook, Communication Studies (M)

202 2:15 pm
*Work-Life Balance and Policies Among Tenured/ Tenure-Track Professors in California Public Institutions of Higher Education*
Sandy Somo, Sociology (M)

Session C-3

**Oral Presentation:**
Higher Education: Teaching & Learning
Friday, March 4, 2016, 1:00 pm
Location: Tehuanco

203 1:00 pm
*Establishing an International Student Exchange Program in Environmental Sustainability between SDSU and Xavier Univeristy of Bhubaneswar, India*
Amanda Pham, Public Health (U)

204 1:15 pm
*Half Time Teaching and Learning with an Intramural High School Robotics Competition*
Lindsay White, Electrical Engineering (U)

205 1:30 pm
*Do Student Loans affect College Major Selection?*
Jeremy Juybari, Economics/Quantitative Analysis/Interdisciplinary Studies (U)

206 1:45 pm
*Fail Montezuma! The Last Vestiges of an Obscured Yet Stubbornly Persistent Culture of Racism at San Diego State University*
Ozzie Monge, MALAS (M)

207 2:00 pm
*Raising Standards: Experimental Peer Benchmarking and its Effect on Grade Point Average and Goal Orientation*
Scott Plambek, Communication (M)

208 2:15 pm
*Students Attitudes to the Learning Glass*
Polly Card, Education (D)

Session C-4

**Oral Presentation:** Interdisciplinary
Friday, March 4, 2016, 1:00 pm
Location: Aztlan

209 1:00 pm
*Revisions on the Traditional Model of Teaching Computer Science*
Dennis Thompson, Computer Science (U)
<table>
<thead>
<tr>
<th>Session C-5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Oral Presentations:</strong> Computational Methods in Aerospace &amp; Mechanical Engineering</td>
</tr>
<tr>
<td><strong>Friday, March 4, 2016, 1:00 pm</strong></td>
</tr>
<tr>
<td><strong>Location:</strong> Metztli</td>
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<tr>
<td>210</td>
<td>1:15 pm</td>
<td>“I Didn’t Know That Was Illegal”: A Portrait of SDSU Worker-Learners</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Trevor Auldridge, Sociology (U)</td>
</tr>
<tr>
<td>211</td>
<td>1:30 pm</td>
<td>Shallow Waves in Density Stratified Bilinear Shear Currents</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Theresa Morrison, Applied Mathematics (U)</td>
</tr>
<tr>
<td>212</td>
<td>1:45 pm</td>
<td><em>Designing optical metamaterials with hyperbolic dispersion based on Al:ZnO/ZnO nano-layered structure using Atomic Layer Deposition</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Priscilla Kelly, Computational Science (M)</td>
</tr>
<tr>
<td>213</td>
<td>2:00 pm</td>
<td>Full Elasticity of Local Singular Arithmetic Congruence Monoids</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jason Thoma, Mathematics (M)</td>
</tr>
<tr>
<td>214</td>
<td>2:15 pm</td>
<td>Factors Leading to Student Veteran Achievement in Postsecondary Education: Reexamining a Structural Equation Model Utilizing the Community College Survey of Men (CCSM)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Thomas De La Garza, Education (D)</td>
</tr>
</tbody>
</table>

**Session C-6**

**Oral Presentation:**
Political Theory, Opinion, & Identity
Friday, March 4, 2016, 1:00 pm
Location: Templo Mayor

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>221</td>
<td>1:00 pm</td>
<td>History as Political Theory: Thucydides, Machiavelli, and Trotsky</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Genevieve Jones, Political Science (U)</td>
</tr>
<tr>
<td>222</td>
<td>1:15 pm</td>
<td>The Media, Public Opinion, and the Supreme Court: An Analysis of Obergefell v. Hodges (2015) and the Relationship Between the Supreme Court and the American People</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Katelyn Madar, Political Science (U)</td>
</tr>
<tr>
<td>223</td>
<td>1:30 pm</td>
<td>Islam on Homosexuality: Violent and Nonviolent?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sierra Marcelius, International Security and Conflict Resolution (U)</td>
</tr>
<tr>
<td>224</td>
<td>1:45 pm</td>
<td>Captives and their monsters: Examining the use of captivity narratives in the media construction of the Muslim as a monster.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mary Stout, History (M)</td>
</tr>
<tr>
<td>225</td>
<td>2:00 pm</td>
<td>Reluctant Fighters: Ordinary Soldiers in the Croatian Civil War</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Andrej Radic, History (M)</td>
</tr>
</tbody>
</table>
226 2:15 pm  
**Neoliberalism in Higher Education:**  
*Social Stockholm Syndrome*  
Brandon Edwards-Schuth, Philosophy (M)

---

**Session C-7**  
**Oral Presentation:**  
Books, Comics, & Digital Humanities  
Friday, March 4, 2016, 1:00 pm  
Location: Visionary Suite

227 1:00 pm  
**Sociodigital Coding: A Deep Dive into Digital Annotation**  
Theodore Bruni, English (U)

228 1:15 pm  
**The Importance of Art in Today’s Wired World**  
Sean Tracy, Philosophy (U)

229 1:30 pm  
**Marginal Weavings and the Book as an Interface**  
Riley Wilson, English (U)

230 1:45 pm  
**The Digital Humanities and Literature**  
Allison Tester, English (U)

---

**Session C-8**  
**Oral Presentation:**  
Communication, Learning & Health  
Friday, March 4, 2016, 1:00 pm  
Location: Legacy Suite

233 1:00 pm  
**An Electrophysiological Study of Initial American Sign Language Acquisition in Adult Learners**  
Megan Mott, Psychology (U)

---

234 1:15 pm  
**Cancer Fatalism in the Deaf Community**  
Dena Kaufman, Psychology (U)

235 1:30 pm  
**HPV vaccine sentiment among Twitter users: An assessment of inter-rater reliability**  
Marcus Lewis, Psychology (U)

236 1:45 pm  
**Cell Phone Anxiety and Test Performance**  
Jocelyn Willsey, Psychology (U)

---

237 2:00 pm  
**A Theoretical Model of the Communicative Construction of Play**  
Hayden Harrower, Communication (M)

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**Session D: Oral Presentations**

**Session D-1**  
**Oral Presentation:**  
Cell Biology, Microbiology & Virology  
Friday, March 4, 2016, 3:00 pm  
Location: Pride Suite

238 3:00 pm  
**Verifying the Genotypes of Mice Susceptible to Colorectal Cancer**  
Mario Tavakoli, Biology (U)

239 3:15 pm  
**In vivo Induction of ectopic organ**  
Isaac Marquez, Biochem (U)

240 3:30 pm  
**Consequences of telomere dysfunction of intestinal crypt stem cells**  
Dustin Burkman, Biology (U)

241 3:45 pm  
**Elucidating Protein Interactions between Hepatitis C Virus Capsid Protein and the COP9 Signalosome**  
Julia Weisbrod, Cell and Molecular Biology (M)

242 4:00 pm  
**Dietary Antimicrobials and Prophage Inducers: Towards Landscaping of the Human Gut Microbiome**  
Lance Boling, Cell and Molecular Biology (M)
<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Presenter</th>
<th>Student Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:15 pm</td>
<td>The Role of Astrocytes During Bacterial Central Nervous System Infection</td>
<td>Thomas Weston, Biology (M)</td>
<td></td>
</tr>
<tr>
<td>4:30 pm</td>
<td>Viral Genome Packaging in-like bacteriophages</td>
<td>Sean Benler, Biology (D)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Session D-2</strong></td>
<td></td>
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<tr>
<td></td>
<td><strong>Oral Presentation</strong>: Marine Biology</td>
<td></td>
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<td></td>
<td><strong>Friday, March 4, 2016, 3:00 pm</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Location</strong>: Park Boulevard</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:00 pm</td>
<td>Impacts of Rainfall Alteration and Invasive Plant Species on Soil Structure in Coastal Sage Ecosystems</td>
<td>Risha Al Sawad, Microbiology (U)</td>
<td>(U)</td>
</tr>
<tr>
<td>3:15 pm</td>
<td>Cross-species microsatellite markers: Tools to investigate mating systems of puff adders (Bitis arietans)</td>
<td>Eliana Moustakas, Biology (U)</td>
<td>(U)</td>
</tr>
<tr>
<td>3:30 pm</td>
<td>Effects of Pollution on the Shore of El Naranjo Sea Turtle Nesting Beach, Nayarit, Mexico</td>
<td>Jeremy Zaida, Biology (U)</td>
<td>(U)</td>
</tr>
<tr>
<td>3:45 pm</td>
<td>Landscape genetics of the San Diego Fairy Shrimp (Branchinecta sandiegonensis)</td>
<td>Natalie Goddard, Biology (M)</td>
<td>(M)</td>
</tr>
<tr>
<td>4:00 pm</td>
<td>The Evolutionary Story of Pogogyne, a California Floristic Province Vernal Pool Endemic</td>
<td>Amanda Everett, Evolutionary Biology (M)</td>
<td>(M)</td>
</tr>
<tr>
<td>4:15 pm</td>
<td>*Coral Reef Geometry Wars: Using coral geometry to understand coral-algal interactions</td>
<td>Emma George, Cell and Molecular Biology (M)</td>
<td>(M)</td>
</tr>
<tr>
<td>4:30 pm</td>
<td>Cascading Non-consumptive Effects of Predatory Fish Drive Habitat Loss in the Kelp Forest</td>
<td>Miranda Brett, Biology (M)</td>
<td>(M)</td>
</tr>
</tbody>
</table>

**Session D-3**

**Oral Presentation**: Oral Health

**Friday, March 4, 2016, 3:00 pm**

**Location**: Tehuano

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Presenter</th>
<th>Student Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:00 pm</td>
<td>Parent-Assisted Oral Care: Results from an Empirical Analysis</td>
<td>Andrew Jen, Marketing (U)</td>
<td>(U)</td>
</tr>
<tr>
<td>3:30 pm</td>
<td>Illuminating the Pathway to Good Oral Health for Mexican Migrant Teens</td>
<td>Mark Jason Cabudol, Anthropology (U)</td>
<td>(U)</td>
</tr>
<tr>
<td>3:45 pm</td>
<td>Assessing barriers to utilization of dental service among underserved seniors</td>
<td>Ally Lu, Public Health (U)</td>
<td>(U)</td>
</tr>
</tbody>
</table>

**Session D-4**

**Oral Presentation**: Interdisciplinary

**Friday, March 4, 2016, 3:00 pm**

**Location**: Aztlan

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Presenter</th>
<th>Student Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:00 pm</td>
<td>Induced in vivo reprogramming of cells across germ layers</td>
<td>Cambria Monroe, Cellular and Molecular Biology (U)</td>
<td>(U)</td>
</tr>
<tr>
<td>3:15 pm</td>
<td>*SDSU Climate Action Plan</td>
<td>Rafael Guerrero, Economics and Philosophy (U)</td>
<td>(U)</td>
</tr>
<tr>
<td>3:30 pm</td>
<td>Logan Heights Community Redevelopment Project</td>
<td>Yunyi-Silvia Zhou Liu, Political/Business Administration (U)</td>
<td>(U)</td>
</tr>
</tbody>
</table>
### Session D-5

**Oral Presentation:** Ancient Cultures  
Friday, March 4, 2016, 3:00 pm  
Location: Metztli

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Presenter</th>
<th>Field</th>
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</thead>
<tbody>
<tr>
<td>3:00</td>
<td>Germanic and Aztec Holistic Medicinal Practices: A Comparative Analysis of their Healers, Texts, and Beliefs Across Time</td>
<td>Nicole Spuehler, Humanities and Spanish (U)</td>
<td></td>
</tr>
<tr>
<td>3:15</td>
<td>The Relación de Michoacán and the Florentine Codex: Friars, Scribes, and Contested Authorship</td>
<td>Jose Renteria, Latin American Studies (M)</td>
<td></td>
</tr>
<tr>
<td>3:30</td>
<td>Ghosts, Dreams, and Erotic Spells in Virgil's Aeneid Books 1–4</td>
<td>Christine Wong, History (M)</td>
<td></td>
</tr>
<tr>
<td>3:45</td>
<td>Witches and Accusers or Ingredients and Targets: Finding Children in Greco-Roman Magic</td>
<td>Brittany Daniloff, History (M)</td>
<td></td>
</tr>
<tr>
<td>4:00</td>
<td>The Unique Tapestry of the Hellenized Jew</td>
<td>Samantha Young, History (M)</td>
<td></td>
</tr>
<tr>
<td>4:15</td>
<td>Theatrical Radicals: Indigenous Challenges to the Three Unities</td>
<td>Desmond Hassing, Theatre Arts (M)</td>
<td></td>
</tr>
</tbody>
</table>

### Session D-6

**Oral Presentation:**  
Identity, Gender and Performance  
Friday, March 4, 2016, 3:00 pm  
Location: Templo Mayor

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Presenter</th>
<th>Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:00</td>
<td>Gendered Perceptions of Soviet Women in the New York Times during World War II</td>
<td>Tia Dang, History (M)</td>
<td></td>
</tr>
<tr>
<td>3:15</td>
<td>The Power to Decide: The Subversion of Androcentrism in Mujeres de ojos grandes (1990) by Angeles Mastretta</td>
<td>Miroslava Alvarado, Spanish (M)</td>
<td></td>
</tr>
<tr>
<td>3:30</td>
<td>Hip Hop: An Expression of Social Dissent and Political Engagement</td>
<td>Matthew Sawh, History (M)</td>
<td></td>
</tr>
<tr>
<td>3:45</td>
<td>Rainbow Edge: Seeking Meaning for Fractured Gender and Sexual Identities through Performativity</td>
<td>Zhenyu Tian, Communication (M)</td>
<td></td>
</tr>
<tr>
<td>4:00</td>
<td>The Destruction of Binary Gender Identity in Popular Culture Representations</td>
<td>Iris Farrou, Rhetoric and Writing Studies (M)</td>
<td></td>
</tr>
</tbody>
</table>

### Session D-7

**Oral Presentation:**  
Philosophy: Metaphysics, Ethics & Continental  
Friday, March 4, 2016, 3:00 pm  
Location: Visionary Suite

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Presenter</th>
<th>Field</th>
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</thead>
<tbody>
<tr>
<td>3:00</td>
<td>A Critique of Scientific Knowledge and Contemporary Psychology</td>
<td>Ricky DeSantis, Philosophy (U)</td>
<td></td>
</tr>
<tr>
<td>3:15</td>
<td>Mathematics and Free Will</td>
<td>William Riekstins, Philosophy (U)</td>
<td></td>
</tr>
<tr>
<td>3:30</td>
<td>The Banach-Tarski Paradox: A Philosophical Validation of Democritean Metaphysics</td>
<td>Ryan Stanford, Philosophy (U)</td>
<td></td>
</tr>
</tbody>
</table>
Saturday, March 5, 2016

Session I: Oral Presentations

Session I-1

Oral Presentation: Tinker Group 1
Saturday, March 5, 2016, 9:00 am
Location: Pride Suite

288 9:00 am
Family Planning, the Fertility Problem, and Inequality in Cuba: Socioeconomic and Racial Implications for the Next Economic Crisis
Alana Rodriguez, Latin American Studies/Epidemiology (M)

289 9:15 am
Bullets and Babies: The Effects of Nacrotraficante Related Violence on Reproductive Life Planning on the Coast of Guerrero, Mexico
Sarah Friedman, Public Health (M)

290 9:30 am
Ideology of the Middle Class in Colombia: Towards a General Theory of Democratic Consolidation
Andrea Arango, Political Science (M)

292 9:45 am
Exploratory study of health risks and protective factors among adolescent children of migrants in a Maya community in Yucatán, México
Isela Martínez SanRomán, Public Health/Latin American Studies (M)

Session I-2

Oral Presentation: Mechanical & Bioengineering
Saturday, March 5, 2016, 9:00 am
Location: Park Boulevard

293 9:00 am
*Carbon Particle Tracking and Oxidation in a Small Particle Solar Receiver
Trent Martin, Mechanical Engineering (M)

294 9:15 am
*The Effects of Receiver Shape and Flow Direction on the Efficiency of a Small Particle Solar Receiver
Ryan Contois, Mechanical Engineering (M)
Session I-3

Oral Presentation:
Binge Eating & Juvenile Health
Saturday, March 5, 2016, 9:00 am
Location: Tehuano

295 9:30 am
*The Monte Carlo Method To The Discrete Ordinates Methods In Fluent For Calculating Radiation Heat Transfer In A Small Particle Receiver
Eugene Cho, Mechanical Engineering (M)

296 9:45 am
*Comparison of Flame Spread over Thick Polymethylmethacrylate Sheets in Narrow Channel Apparatus and a Microgravity Environment
Tirthesh Shah, Mechanical Engineering (M)

297 10:00 am
Penetrating GC-MEMS Electrode Array Fabrication for Coupled Electrophysiological Signal and Neurotransmitter Detection
Mieko Hirabayashi, Bioengineering (D)

298 10:15 am
*Power ultrasound treatment of microalgae for energy generation and growth media effects on performance
Rory Klinger, Environmental Engineering (D)

Session I-4

Oral Presentation:
Migration, Identity, & Higher Education
Saturday, March 5, 2016, 9:00 am
Location: Aztlan

303 10:00 am
Validity and Reliability of the IES-2 in Valorando Nuestros Cuerpos: An Intuitive Eating Intervention for Latinas
Jessica Hawks, Public Health (D)

304 10:15 am
Early obesity onset and its relationship to cardiovascular risk in adolescence: A longitudinal study of a Chilean cohort
Lorena Pacheco, Public Health/Epidemiology (D)

305 9:00 am
*Hungry and Homeless
Jeanette Corona, Chicano and Chicana Studies (U)

306 9:15 am
Chinese Migration and the Rise of Agribusiness
Andrew Alvarez, Education (U)

307 9:30 am
Motherhood: An Imperative in African Womanhood
Kiedra Taylor, Comparative Literature (U)

308 9:45 am
Afro-Mexico: Negotiating a Cultural Identity through Dance
Joana Guzman, History (M)

309 10:00 am
Intercultural Friendship Formation Between East Asian and Vietnamese International Students in the U.S. and Their Host Nationals
Erika Nakayama, Communication (M)

310 10:15 am
The University of Ibadan: A Study of Postcolonial Knowledge
Christian Alvarado, History (M)
### Session I-5

**Oral Presentation:** Borderlands & Communities  
Saturday, March 5, 2016, 9:00 am  
Location: Metztli

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Presenter, Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 am</td>
<td><em>The Influence of Family Roles on Latinas and their Academic Identity</em></td>
<td>Diana Chagolla, Sociology (U)</td>
</tr>
<tr>
<td>9:15 am</td>
<td><em>Anxiety Disorders and Cultural Concepts of Distress among Latino Deportees Living in a Border Community in Mexico</em></td>
<td>Juan Peña, Psychology (U)</td>
</tr>
<tr>
<td>9:30 am</td>
<td><em>The Minority within the Minority: The Central American Latina Experience</em></td>
<td>Melanie Sandoval, Psychology (U)</td>
</tr>
<tr>
<td>9:45 am</td>
<td><em>The Effects of Mexican Hometown Associations</em></td>
<td>Luz Hernandez, Criminal Justice (U)</td>
</tr>
<tr>
<td>10:00 am</td>
<td><em>Intergroup Friendships: The Inner Workings of Self-Disclosure in Interracial Relationships</em></td>
<td>Ashley Weinberg, Psychology (M)</td>
</tr>
<tr>
<td>10:15 am</td>
<td><em>Tensions on The Wall: Discursive Polarization of Houseless Identities</em></td>
<td>Breanne Acio, Communication (M)</td>
</tr>
</tbody>
</table>

### Session I-6

**Oral Presentation:** Ecology & Evolutionary Biology  
Saturday, March 5, 2016, 9:00 am  
Location: Templo Mayor

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Presenter, Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 am</td>
<td><em>Historical Isolation and Future Adaptation: Using Evolutionary Genomics to Conserve the Yosemite Toad</em></td>
<td>Paul Maier, Evolutionary Biology (D)</td>
</tr>
<tr>
<td>9:15 am</td>
<td><em>Genetic Admixture in the San Diego Fairy Shrimp (Branchinecta sandiegensis)</em></td>
<td>Ketan Patel, Evolutionary Biology (D)</td>
</tr>
<tr>
<td>9:30 am</td>
<td><em>Distinct and stable microbiome structure from the Common thresher shark (Alopias vulpinus)</em></td>
<td>Michael Doane, Ecology (D)</td>
</tr>
<tr>
<td>9:45 am</td>
<td><em>Linking diet-mediated performance to patch selection of an omnivorous ladybeetle</em></td>
<td>Shelby Rinehart, Ecology (D)</td>
</tr>
<tr>
<td>10:00 am</td>
<td><em>Do Microbial Communities Control Emissions of the Greenhouse Gas Methane in Arctic Soils?</em></td>
<td>Robert Wagner, Ecology (D)</td>
</tr>
<tr>
<td>10:15 am</td>
<td><em>Metagenomic Investigation of the Viruses of Marine Kelp</em></td>
<td>Douglas Beattie, Biology (D)</td>
</tr>
</tbody>
</table>

### Session I-7

**Oral Presentation:** Philosophy: God, Ethics, & Beauty  
Saturday, March 5, 2016, 9:00 am  
Location: Visionary Suite

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Presenter, Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 am</td>
<td><em>Plato, Seneca and Aristotle on Virtue as a likeness to God</em></td>
<td>Luis Huerta, Philosophy (U)</td>
</tr>
<tr>
<td>9:15 am</td>
<td><em>Why Mysticism May Be Important for the Search of Truth</em></td>
<td>Alec Wilkinson, Physics/Philosophy (U)</td>
</tr>
<tr>
<td>9:30 am</td>
<td><em>An Inquiry into the Implications of al-Ghazlai’s Occasionalism on the Pursuit of Science</em></td>
<td>Sean Rice, Philosophy (U)</td>
</tr>
<tr>
<td>9:45 am</td>
<td><em>R. Tuomela’s Social Ontology</em></td>
<td>Julia Strobel, Philosophy (U)</td>
</tr>
<tr>
<td>10:00 am</td>
<td><em>A Modern Look at the Beautiful Life</em></td>
<td>Nathaniel Hale, Philosophy (U)</td>
</tr>
</tbody>
</table>
Session I-8

**Oral Presentation:** Astronomy & Stars

Saturday, March 5, 2016, 9:00 am

Location: Visionary Suite

328 9:00 am

*Photometric Observations of Eclipsing Cataclysmic Variables: DW Ursae Majoris and DO Leonis*

Benjamin Kuhn, Astronomy (U)

329 9:15 am

*Ultraviolet and X-Ray Analysis of Superluminous Supernovae*

Melanie Kae Olaes, Astronomy (U)

330 9:30 am

Numerical Analysis of the Gravitational Redshift and Mass Quadrupole Moment of Deformed Compact Stars

Alexis Romero, Physics (U)

331 9:45 am

Detailed Modeling of Higher Order Hierarchical Kepler Star Systems

Joanna Gore, Astronomy (M)

332 10:00 am

Improved Dynamical Parameters for Transiting Circumbinary Planets

Pantelis Thomadis, Astronomy (M)

333 10:15 am

Hyperons, Delta Baryons, and Deconfined Quarks in Neutron Star Cores

William Spinella, Computational Science (D)

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**Session J: Oral Presentations**

Session J-1

**Oral Presentation:** Tinker Group 2

Saturday, March 5, 2016, 11:00 am

Location: Pride Suite

334 11:00 am

*Education within Brazil’s Landless Workers’ Movement: Validating life and opportunity in the Brazilian countryside*

Casey Mellnik, Latin American Studies (M)

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335 11:15 am

Preliminary research into creating a feasibility study for an integrated tobacco control intervention within the existing TB and HIV/AIDS treatment programs of a Brazilian Family Health Center.

Erik Hendrickson, Global Health (D)

336 11:30 am

Democracy and Rule of Law in El Salvador

Andrew Oliver, Latin American Studies (M)

337 11:45 am

How Policy Can Support Local Community Development Initiatives to Mitigate the Need for Out-Migration

Deanna Wolf, Public Administration (M)

---

Session J-2

**Oral Presentation:**

Perceptions, Identity, Self-Esteem & Stereotypes

Saturday, March 5, 2016, 11:00 am

Location: Park Boulevard

338 11:00 am

*What's My Age Again? Sample Differences on Perceived (Dis)ability*

Karen Key, Psychology (U)

339 11:15 am

Sexual Self-Esteem, Sexual Self-Efficacy, Sexual Assertiveness: A Significant Threesome?

Martha Martinez, Psychology (U)

340 11:30 am

Fashion for Me! Dress Code and the Rise of Middle School Feminism

Ariel Beermann-Young, Education (M)

341 11:45 am

Majorities and Minorities Under Threat

Nathan Honeycutt, Psychology (M)

342 12:00 pm

Experiencing and Witnessing Domestic Violence as Predictors of Child Attribution

Duyen Trang, Psychology (M)
Session J-3

**Oral Presentation:** Neural & Motor Biology
Saturday, March 5, 2016, 11:00 am
Location: Tehuanco

343 12:15 am
*Developmental Assets as Predictors of Multiracial High School Students Identity Development & Academic Achievement*
Nicole Belisle, Teacher Education (D)

344 11:00 am
*Identification and Characterization of Motor Neurons in Planarian Flatworms*
Brian Dockter, Biology (U)

345 11:15 am
*The Potential Role of Astrocytes in Cognitive Flexibility*
Andres Bermudez, Biology (U)

346 11:30 am
*Attenuating Obesity-Induced Striated Muscle Dysfunction with Time-Restricted Feeding*
Jesus Villanueva, Cell and Molecular Biology (M)

347 11:45 am
*Molecular Basis and Amelioration of Mutant Lamin-Induced Progressive Myopathy*
Sahaana Chandran, Cell and Molecular Biology (M)

348 12:00 pm
*Neurocognitive performance of adolescents who were iron deficient in infancy and overweight or obese during adolescence: a test of a two-hit nutritional insults*
D. Eastern Kang Sim, Public Health (D)

349 12:15 pm
*Reduced Basal Ganglia and Cerebellum Volumes in Adolescents and Young Adults with FASD*
Sarah Inkelis, Clinical Psychology (D)

Session J-4

**Oral Presentation:** Linguistics & Archaeology
Saturday, March 5, 2016, 11:00 am
Location: Aztlan

350 11:00 am
*The Mystery at Paradox Valley: The Artifacts of 5MN191*
James Turner, Anthropology (M)

351 11:15 am
*A Histological Analysis of a Formative Period Population from Cerro de la Cruz in the lower Rio Verde Valley region of Oaxaca, Mexico*
Roberto Vega, Anthropology (M)

352 11:30 am
*Testing Spatial Relation Comprehension in American Sign Language Users*
Chris Brozdowski, Language & Communicative Disorders (D)

353 11:45 am
*Visual Perspective-taking Strategies are Mediated Differently by Gender for Deaf Signers and Hearing Nonsigners*
Kristen Secora, Language and Communicative Disorders (D)

354 12:00 pm
*Towards a clinically viable measure of sentence context usage*
Charles Ruby, Audiology (D)

355 12:15 pm
*Phonological effects on grammatical morpheme accuracy in bilingual children*
Philip Combiths, Language & Communicative Disorders (D)

Session J-5

**Oral Presentation:** Interdisciplinary
Saturday, March 5, 2016, 11:00 am
Location: Metztli

356 11:00 am
*The Connection and Correlations Between the Early Vice Industry of Mexicali and the Relationship Between the Imperial County and Mexicali*
Edgar Bernal Sevilla, History (U)
357 11:15 am
Open source dataset for imaging through atmospheric turbulence.
Nicholas Ferrante, Mathematics (U)

358 11:30 am
Incorporating a New Generation of Novel Sensors in Human Space Flight Applications: Contemporary Challenges and Opportunities
Ahmad Soomro, Statistics: Statistical Computing (U)

359 11:45 am
A Bioinformatics Approach to Find Mouse DNA Repeats Significant in Aggressive Colon Cancer
Nitya Bhaskaran, Microbiology (M)

360 12:00 pm
Genome Binning to Improve the Quality of Genomes Identified from Metagenomes
Bhavya Papudeshi, Bioinformatics & Medical Informatics (M)

361 12:15 pm
Molecular Dynamics Calculations Performed on a Panel of Ubiquitin-Protein G Variants using the AMBER 14
Aishani Chittoor Prem, Bioinformatics (M)

362 12:30 pm
*Which Parameters are Important? A Sensitivity Analysis of Nuclear Interactions
Stephanie Lauber, Computational Science (D)

Session J-6
Oral Presentation: Drug Use & Cancer
Saturday, March 5, 2016, 11:00 am
Location: Templo Mayor

363 11:00 am
Drug use by agricultural labor
Humberto Dominguez, History (U)

364 11:15 am
Drugs Feeding America
Enrique Sanchez, Social Science (U)

365 11:30 am
NIH Toolbox Fluid Cognition in Youth with Histories of Heavy Prenatal Alcohol Exposure
Gabriela Gonzalez, Psychology (U)

366 11:45 am
Effects of Late Gestational Cannabinoid Exposure on Behavioral Development in Rats
Brandonn Zamudio, Psychology (U)

367 12:00 pm
The Effects of Providers on Metastatic Cancer Patient’s Decision to Enter Hospice in the United States
Somia Said, Public Health/Biometry (M)

Session J-7
Oral Presentation: Antennas & Digital Signal Processing
Saturday, March 5, 2016, 11:00 am
Location: Visionary Suite

368 11:00 am
Frequency Estimation Utilizing the Overlapping Autocorrelation
Michael Martinez, Electrical Engineering (M)

369 11:15 am
2 Elements MIMO Antenna for Tablet Application
Anthony Wang, Electrical Engineering (M)

370 11:30 am
A Single Feed Planar Antenna With 4G Tunable Bands and Consistent Upper LTE Bands Between 1.51 GHz – 2.1 GHz
Rafid Damman, Electrical Engineer (M)

371 11:45 am
Frequency Agile Dual Polarized Patch Fed Dielectric Lens High Gain Antenna
Asmita Chaugule, Electrical Engineering (M)

372 12:00 pm
A Multifunctional Phased Array Antenna with Frequency Agility and Polarization Reconfigurability
Behrouz Babakhani, Electrical & Computer Engineering (D)
Poster Presentations
Friday, March 4, 2016
Sessions A, B, C, D and G

An asterisk at the beginning of a presentation title denotes an exhibit, poster or talk that uses the SDSU common experience theme of Energy.

Energy is defined as human energy, mechanical energy or creative energy.
Friday, March 4, 2016
Session A: Poster Presentations

Session A-9
Poster: Flowing Fluids & Sparking Plasmas
Friday, March 4, 2016, 9:00 am – 10:30 am
Location: Montezuma Hall

373 Poster #1
San Diego State University Water Tunnel
Marlon Gerson, Aerospace Engineering (U)

374 Poster #2
Nonlinear Aeroelastic Analysis of Flapping Micro Air Vehicles
Enrico Santarpia, Aerospace Engineering (D)

375 Poster #3
Instantaneous Pressure Reconstruction from Measured Pressure Gradient using Rotating Parallel Ray Method
Jose Moreto, Engineering Sciences (D)

376 Poster #4
Densification Mechanism and Mechanical Properties of Tungsten Powder Consolidated by Spark Plasma Sintering
Geuntak Lee, Mechanical Engineering (D)

377 Poster #5
*Densification, Microstructure and Grain Growth in Spark Plasma Sintering of Zirconium Carbide Powder
Xialu Wei, Mechanical Engineering (D)

378 Poster #6
*Optimization of Material Structure during Spark Plasma Sintering
Diletta Giuntini, Mechanical Engineering (D)

Session A-10
Poster: Protein & Cell Engineering
Friday, March 4, 2016, 9:00 am – 10:30 am
Location: Montezuma Hall

379 Poster #7
Investigating Proteolytic Activity of Viral Proteases as Target for Antivirals in a Cell-based Context
Veronica Bichara, Cell and Molecular Biology (M)

380 Poster #8
An in vitro Investigation on Proliferation, Survival, and Differential Potential of CardioClusters
Kevin White, Biology (U)

381 Poster #9
Increased Extracellular Matrix Stiffness Decreases Proliferation of MCF-7 Cancer Cells in 3D Culture
Carlos Brambila, Biology/Bioengineering (U)

382 Poster #10
Insights into the Assembly of the Threonylcarbamoyl Adenosine ($t^6$A) Biosynthesis System
Sunjeet Baadkar, Biochemistry (M)

383 Poster #11
Expression, purification, and validation of ANN-predicted phage structural proteins
Shr-Hau Hung, Biology (D)

384 Poster #12
Beta-Hairpins: Molecular Accessories for Helical Peptide Expression
Melissa Lokensgard, Chemistry (D)

385 Poster #13
Identification of biomarkers for clinical trials in Friedreich’s ataxia
Lina Petrosyan, Biology (U)

386 Poster #14
Functional significance of TCP chaperonin complex in maintaining cardiac and skeletal muscle function.
Luis Pablos, Biology (U)

387 Poster #15
Modeling the Structural Origins of Drug Resistance to Isoniazid via key Mutations in Mycobacterium tuberculosis Catylase-Peroxidase, KatG
Matt Marney, Chemistry (U)

388 Poster #16
Dopaminergic Differentiation of Human Induced Pluripotent Stem Cells Derived from Parkinson’s Disease Patients for Autologous Cell Therapy
Jacob Ruby, Biology (U)

Please turn off all cell phones and other devices.

Student Level: (U)=Undergraduate; (M)=Masters; (D)=Doctoral
<table>
<thead>
<tr>
<th>Poster #17</th>
<th>Correlation of IL 12p35 and IL4 levels in colonic tumors in a mouse model of colorectal cancer</th>
<th>Savannah Sawaged, Biology (U)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poster #18</td>
<td>Role of Autophagy Protein ATG16L1 in Group B Streptococcal Entry into Brain Endothelial Cells</td>
<td>Mirae Dong, Microbiology (U)</td>
</tr>
</tbody>
</table>

**Session A-12**

**Poster:** Predicting Space & Time
Friday, March 4, 2016, 9:00 am – 10:30 am
Location: Montezuma Hall

<table>
<thead>
<tr>
<th>Poster #19</th>
<th>Using Ellipsoidal Variations to Find Black Holes</th>
<th>Matthew Garrett, Astronomy (U)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poster #20</td>
<td><em>Comparison of Bootstrap Methods for Prediction Interval in Time Series Analysis</em></td>
<td>Thiago Karashima, Statistics (M)</td>
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<tr>
<td>Poster #21</td>
<td>A genome sequence search engine for papers</td>
<td>Heqiao Liu, Computer Science (M)</td>
</tr>
<tr>
<td>Poster #22</td>
<td><em>Using Palomar Transient Factory Survey Data to Confirm Gravitationally Lensed Quasar Candidates</em></td>
<td>Isaac Spitzer, Astronomy (M)</td>
</tr>
<tr>
<td>Poster #23</td>
<td>Moderate Ethanol Consumption Regulates Lipid Metabolism and Inflammatory Gene Expression in Rats</td>
<td>Meegan Justice, Nutritional Sciences (M)</td>
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</tbody>
</table>

**Session A-13**

**Poster:** Water, Toxins, & Health
Friday, March 4, 2016, 9:00 am – 10:30 am
Location: Montezuma Hall

<table>
<thead>
<tr>
<th>Poster #24</th>
<th>Measuring the Success of Physical Barriers as Effective Tools for Aiding the Conservation of La Jolla’s Harbor Seal Colony</th>
<th>Rachel Guches, Sustainability (U)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poster #25</td>
<td>Characterization of E. coli In Recreational Waters of the Riviera Nayarit, Mexico and Possible Implications for Human Health</td>
<td>Megan Malone, Public Health (U)</td>
</tr>
<tr>
<td>Poster #26</td>
<td><em>Persistence of Oil-Derived Hydrocarbons in a Coastal Environment</em></td>
<td>Cari Campbell, Environmental Engineering (U)</td>
</tr>
<tr>
<td>Poster #27</td>
<td>A Role for Marine Macro Algae in Speciation of Iodine in the Coastal Ocean</td>
<td>Jennifer Gonzales, Geological Sciences (U)</td>
</tr>
<tr>
<td>Poster #28</td>
<td>Bioaccumulation of Cigarette Butt Toxicants in the Freshwater Fish, Oncorhynchus mykiss, and Saltwater Mussel, Mytilus galloprovincialis</td>
<td>Lenard Yabes, Environmental Health (M)</td>
</tr>
</tbody>
</table>

**Session A-14**

**Poster:** Catalysis 1
Friday, March 4, 2016, 9:00 am – 10:30 am
Location: Montezuma Hall

<table>
<thead>
<tr>
<th>Poster #29</th>
<th>Crystallization of the Nitrile Reductase QueF in Complex with Substrate and Cofactor</th>
<th>Vanessa Quach, Chemistry/Biochemistry (U)</th>
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</thead>
<tbody>
<tr>
<td>Poster #30</td>
<td>Characterization and Kinetic Parameters of Full Length Human DNA PolE and Carcinogenic Mutants</td>
<td>Lucas Luna, Chemistry (M)</td>
</tr>
<tr>
<td>Poster #31</td>
<td><em>Bifunctional Catalysts for Selective Oxidation of Water and Organic Substrates</em></td>
<td>Robert Vasquez, Chemistry (U)</td>
</tr>
<tr>
<td>Poster #32</td>
<td>A Study of the Photoinitiated Growth of Silver Nanoparticles Using the Poly(vinyl-alcohol) Group of Polymers as Capping Agents</td>
<td>Ian Marshall, Chemistry (U)</td>
</tr>
<tr>
<td>Poster #33</td>
<td><em>Increasing ligand denticity: as a strategy for a better water oxidation catalyst (WOC)</em></td>
<td>Farzaneh Saeedifard, Chemistry (M)</td>
</tr>
</tbody>
</table>
Session A-15

**Poster:** Childhood Violence  
**Friday, March 4, 2016, 9:00 am – 10:30 am**  
**Location:** Montezuma Hall

**Poster #34**  
*Healthcare as a Variable to Improve Existing Preventative School Violence Measures*  
Michelle Faulkner, Psychology (U)

**Poster #35**  
*Mental Health Screening of Females in Juvenile Detention: Does Age Matter?*  
Tiffany Lapuebla, Social Work (U)

**Poster #36**  
*Role of Children's Hostile Attributions of Key Relationship Figures in Predicting Behavior*  
Shaan McGhie, Psychology (U)

**Poster #37**  
*Violence Exposure and Depressive Symptoms Among High-Risk Children.*  
Cassandra Cala, Psychology (M)

**Poster #38**  
*Examining Acceptance of Violence Beliefs, and Family and Peer Factors in Relation to Teen Relationship Violence*  
Remington Gonzalez, Child and Family Development (M)

Session A-16

**Poster:** Influence of Culture  
**Friday, March 4, 2016, 9:00 am – 10:30 am**  
**Location:** Montezuma Hall

**Poster #40**  
*Pregnant Service Women Effecting the Moral in the U.S Armed Forces*  
Dominique Holton, Psychology (U)

**Poster #41**  
*Residents' Views Toward Nature and Their Engagement in Sustainable Lifestyle Behaviors: A Comparison between Ecuador and Southern California*  
Annemarie Carignan, Sustainability (U)

**Poster #42**  
*Risk, Resilience, and Countercultural Beliefs in Homeless Youth*  
Jennie Buss-Gregory, Social Work (M)

**Poster #43**  
*Does The Duration Of The Study Abroad Program Matter? Understanding How Reverse Cultural Shock Improves Cultural and Political Competence.*  
Sara Roldan, Homeland Security (M)

Session A-17

**Poster:** Speech, Language & Hearing Sciences  
**Friday, March 4, 2016, 9:00 am – 10:30 am**  
**Location:** Montezuma Hall

**Poster #44**  
*The Relationship Between Lingual Proprioception and Speech Production*  
Carlos Arias, Speech, Language, and Hearing Sciences (U)

**Poster #45**  
*Lessons Learned from a Community-Based Preschool Intervention*  
Elaine Drexler, Speech Language & Hearing Sciences (U)

**Poster #46**  
*Pronoun Processing: Eye Tracking of Individuals with Broca’s Aphasia*  
Valeria Garcia, Speech Language and Hearing Sciences (U)

**Poster #47**  
*Word Learning from Context: School-Aged Children with Typical and Atypical Language*  
Jasmine Guantez, Speech, Language, and Hearing Science (U)

**Poster #48**  
*Symbolic Learning and Inhibitory Control in Monolinguals and Bilinguals: A Visual World Study*  
Megan Jeong, Speech, Language, and Hearing Sciences (U)

**Poster #49**  
*The Neural Underpinnings of Word Learning from Context Through Repeated Exposure*  
Chanel Konja, Speech, Language, and Hearing Sciences (U)
Session A-18
**Poster:** Cancer: Bilingual Children
Friday, March 4, 2016, 9:00 am – 10:30 am
Location: Montezuma Hall

422 Poster #50
*Dual Language Interaction in Speech Production: A Case Study of Two Bilingual Children*
Rylee Umstead, Speech, Language, and Hearing Sciences (U)

423 Poster #51
*Code-Switching in Young Spanish-English Bilingual Toddlers and Their Mothers*
Bianka Enriquez, Psychology (U)

424 Poster #52
*Patterns in English morpheme use by preschool-aged Spanish-speaking English Language Learners*
Aizel Agustino, Speech, Language, and Hearing Sciences (M)

425 Poster #53
*Bilingual advantage? Comparison of monolingual English, Spanish and bilingual toddlers*
Yushuang Liu, Psychology (M)

426 Poster #54
*Dual Language Immersion Program Equity and Access: Is there equity for all students?*
Patricia Fernandez, Educational Leadership (D)

Session B: Poster Presentations

Session B-9
**Poster:** Catalysis 2
Friday, March 4, 2016, 10:45 am – 12:15 pm
Location: Montezuma Hall

427 Poster #1
*Exploration of Naphthyridine Pendant Base Assisted Water Oxidation Catalysts*
Ryan Shirey, Chemistry (U)

428 Poster #2
*The Effect of Histidine Absorption on Silver Nanoparticles*
Hannah Elliott, Biochemistry (U)

429 Poster #3
*Bifunctional Catalyzed Sulfenylation of Biologically Active Aromatic Compounds*
Eric Miller, Biochemistry (U)

430 Poster #4
*Distinct Catalytic Strategy of Bacterial-Specific GTP Cyclohydrolase I*
Naduni Paranagama, Biochemistry (M)

431 Poster #5
*Effect of Cyclopentadienyl Ligands on Alkene Isomerization Catalysts*
Patrick Brklycica, Chemistry/Biochemistry (U)

Session B-10
**Poster:** Our Moving Earth
Friday, March 4, 2016, 10:45 am – 12:15 pm
Location: Montezuma Hall

432 Poster #6
*Pecariously balanced rocks (PBRs): first attempt to establish their textural, physical, and chemical properties*
Craig Hall, Geology (M)

433 Poster #7
*Structural Architecture of the Western Transverse Ranges and Potential for Large Earthquakes*
Yuval Levy, Geophysics (D)

434 Poster #8
*Intra-event and Inter-event Ground Motion Variability from 3-D Broadband (0-8 Hz) Ensemble Simulations of Mw 6.7 Thrust Events Including Rough Fault Descriptions, Small-Scale Heterogeneities and Q(f)*
Kyle Withers, Geophysics (D)

435 Poster #9
*Dynamic Fault Weakening and Strengthening by Gouge Compaction and Dilatancy in a Fluid-Saturated Fault Zone*
Evan Hirakawa, Geophysics (D)

436 Poster #10
*Toward A Kinematic Rupture Generator Based on Rough Fault Spontaneous Rupture Models*
William Savran, Geophysics (D)
Session B-11
**Poster:** Left Ventricular Assist Devices & Carotid Compression
Friday, March 4, 2016, 10:45 am – 12:15 pm
Location: Montezuma Hall

437 Poster #11  
*Reduction of Stroke Risk from Embolic Shower Following Cardiac Surgery Using Carotid Compression*  
Paul Isingoma, Bioengineering (M)

438 Poster #12  
*Wall shear stress variation on the ventricular side of the aortic valve leaflets during LVAD support*  
Zhen Wang, Bioengineering (M)

439 Poster #13  
*Modeling of Thrombus Formation in the LVAD Assisted Left Ventricle*  
Brian Herold, Mechanical Engineering (M)

440 Poster #14  
*Evaluation of Intra-Ventricular Flow Field in the LVAD-Assisted Heart: Summary and Future Works*  
Vi Vu, Mechanical and Aerospace Engineering (D)

441 Poster #15  
*LVAD-altered aortic valve biomechanics: Its implications on tissue remodeling and the progression of Aortic Insufficiency (AI),*  
Madiha Jamal, Bioengineering (M)

442 Poster #16  
*The Effect of Reverse Remodeling on Intraventricular Flow in the LVAD-Assisted Heart Studied in a Mock Circulatory Loop*  
Juyeun Moon, Bioengineering (M)

Session B-12
**Poster:** Molecular Biology
Friday, March 4, 2016, 10:45 am – 12:15 pm
Location: Montezuma Hall

443 Poster #17  
*Duration of heat-shock protein activation in Boechera deauparera and Arabidopsis thaliana*  
Tyara Vazquez, Biology/Zoology (U)

444 Poster #18  
*Conserved Structure and Diverse Chemistry in the Biosynthesis of 7-Deazaguanosines*  
Xianghan Mei, Pharmacy (M)

445 Poster #19  
*Cytotoxic Effects of Novel Small Molecules on PC3 Prostate Cancer Cells*  
Parima Udompholkul, Molecular Biology (M)

446 Poster #20  
*Investigation of LEF-1 Flexibility vs DNA Binding Activity*  
Ariana Pientka, Science (M)

447 Poster #21  
*Monitoring Metallo-proteinase Cleavage Activity at the Cell Surface*  
Andre Dharmawan, Cell and Molecular Biology (M)

Session B-13
**Poster:** Synthetic Chemistry
Friday, March 4, 2016, 10:45 am – 12:15 pm
Location: Montezuma Hall

448 Poster #22  
*Synthesis of Potassium Alkenyl Trifluoroborate Salts via Hydroboration of Terminal Alkynes Using Dicyclohexylborane and Two Groups Reductive Elimination with Quinone*  
Khawlah Alanqari, Chemistry (M)

449 Poster #23  
*A Novel Synthesis of Silver Nanoparticles Absorbing in the Infrared*  
Andrew Nuhaily, Chemistry (U)

450 Poster #24  
*Progressive New Methods Towards the Total Synthesis of Azaspirene and its Analogs: Promising New Cancer Treatments*  
Sean Najjar, Chemistry (U)

451 Poster #25  
*A Method to Assemble Larger Supramolecular Structures Through Radical Pi Stacking Interactions Using Viologens*  
Joquel Vasquez, Biochemistry (U)

452 Poster #26  
*Synthesis and Application of Novel Phosphonic Acids via Trifluoroborates*  
Lauren Daley, Biology (U)
Session B-14
Poster: Caregiver
Friday, March 4, 2016, 10:45 am – 12:15 pm
Location: Montezuma Hall

453 Poster #27
Not The Stereotypical Black Teen Mother: Factors that have helped contributed to their success
Myra Hollis, Psychology (U)

454 Poster #28
Predictors of Perceived Barriers to Participation and Effectiveness in Child Mental Health Treatment
Becky Kremer, Psychology (U)

455 Poster #29
The Psychometric Properties of the Arnett Caregiver Interaction Scale (CIS) to Measure the Quality of Early-Childhood Practitioner Caregiver Performance
Kristi Allen, Public Health (M)

456 Poster #30
Differences in Parenting Strategies of Kin vs. Non-Kin Foster Parents
Cleo Mae Burce, Psychology (M)

457 Poster #31
Perceptions of Parent School Collaboration Within Single Parent Households
Jason Josafat, Educational Leadership (D)

Session B-15
Poster: Children’s Health
Friday, March 4, 2016, 10:45 am – 12:15 pm
Location: Montezuma Hall

458 Poster #32
Child and Parent Reports of Food Ordering Behaviors—Is there a difference?
Jessica Cerda, Psychology (U)

459 Poster #33
Children’s Consumption Behavior in Restaurants
Veronica Varela Reyes, Marketing (U)

460 Poster #34
School and Community Level Factors Associated with Change in Student Body Mass Index
Douglas Dalay, Social Work and Public Health (M)

461 Poster #35
Foster Care as a Moderator Between Substance Abuse and Dating Violence
Monica Guzman, Psychology (M)

462 Poster #36
The relationship between acculturation and Chinese parents’ beliefs about young children’s emotions
Jue Zhang, Child and Family Development (M)

Session B-16
Poster: Evolution
Friday, March 4, 2016, 10:45 am – 12:15 pm
Location: Montezuma Hall

463 Poster #37
*Bam Geometry
Maxwell Anthenelli, Physics (U)

464 Poster #38
Identifying isolates that use alginates as a carbon source
Taylor Cram, Microbiology (U)

465 Poster #39
Response of free-ranging sidewinder rattlesnakes (Crotalus cerastes) to the antsnae displays of desert kangaroo rats (Dipodomys deserti)
Malachi Whitford, Ecology (D)

466 Poster #40
Heightened vigilance in desert kangaroo rats (Dipodomys deserti) strengthens evasive response behavior to rattlesnake strikes
Grace Freymiller, Biology/Ecology (M)

467 Poster #41
Phylogenetic Inference of Teiid Lizards Based on Multiple Genes
Steven Byrum, Biology (U)

468 Poster #42
Morphological studies of short-range endemic Japanese and Californian harvestmen (Opiliones: Laniatores: Travunioidea)
Stephanie Castillo, Biology (U)
Session B-17
**Poster**: Marine Microbiology  
Friday, March 4, 2016, 10:45 am – 12:15 pm  
**Location**: Montezuma Hall

469 Poster #43  
*Variation of carbon use of microbial communities in different microhabitats*  
Felicia Miller, Biology (U)

470 Poster #44  
*Phenotypic analysis of 20 marine Vibrio spp. isolated from kelp forests offshore San Diego, California*  
Tucker Lopez, Environmental Health (M)

471 Poster #45  
*The Addition of Coral Reef Invertebrates to the Microbialization Score*  
Joel Huckeba, Biology (U)

472 Poster #46  
*Genetic and Phenotypic Analysis of Gammaproteobacteria*  
Blaire Robinson, Bioinformatics and Medical Informatics (M)

473 Poster #47  
*Elucidation of the Function of Unknown Marine Viral Genes*  
Indrajee Wewaliyadda, Microbiology (M)

474 Poster #48  
*Characterization of Migration in Human Astrocytes Following Bacterial Infection*  
Anna Lehmann, Biology (U)

Session B-18
**Poster**: Construction, Damaged Materials, & Wrestlebrainia  
Friday, March 4, 2016, 10:45 am – 12:15 pm  
**Location**: Montezuma Hall

475 Poster #49  
*Analysis of the Quality Control and Quality Assurance Process in the Construction of Residential Buildings*  
Raphael Milion, Construction Engineering (D)

476 Poster #50  
*The Importance of Supplier Evaluation Ratings and the Quality of Goods Supplied to the Engineering Procure Construct Industry*  
Panthil Desai, Construction Engineering (M)

477 Poster #51  
*Exploration of Surrogate Models for Inverse Identification of Delamination Damage in Composites using Electrical Resistance Change*  
Paulina Diaz Montiel, Aerospace Engineering (M)

478 Poster #52  
*Experimental Comparisons of Progressive Failure Damage in Composite Laminates at Countersunk Bolted Joints Loaded Using Different Bearing Test Fixtures*  
Alexandru Popescu, Aerospace Engineering (M)

479 Poster #53  
*Wrestlebrainia*  
Brett Musolf, Mechanical Engineering (U)

Session C: Poster Presentations

**Session C-9**
**Poster**: Analytical Chemistry  
Friday, March 4, 2016, 12:30 pm – 2:00 pm  
**Location**: Montezuma Hall

480 Poster #1  
*Comparison of the voltammetry of 4 and 5-nitroimidazoles. Implication for the medicinal activity of nitroimidazole*  
Andrew Nguyen, Chemistry (U)

481 Poster #2  
*Combining Capillary Electrophoresis and a Novel Microfluidic-Droplet Device to Detect Fluorescent Biomolecules*  
Eduardo De La Toba, Chemistry (U)

482 Poster #3  
*Investigation of Proton-Coupled Electron Transfer in an Imidazole-containing Phenylenediamine Derivative Using Cyclic Voltammetry*  
Gabriel Sepulveda, Chemistry (U)

483 Poster #4  
*Sensitive Detection of Proteins and Biomarkers by Nonlinear Laser Wave-Mixing Detection and Capillary Electrophoresis*  
Mya Brown, Chemistry (U)

484 Poster #5  
*Photochemical Study of Silver Nanoparticles Formed from the Reduction of Silver Ions by Humic Acid*  
Renee Leslie, Chemistry (M)
### Session C-10

**Poster: Stress**  
*Friday, March 4, 2016, 12:30 pm – 2:00 pm*  
*Location: Montezuma Hall*

<table>
<thead>
<tr>
<th>Poster #</th>
<th>Title</th>
<th>Author</th>
<th>Student Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>#6</td>
<td><em>Post Traumatic Stress Disorder as a Causal System</em></td>
<td>Alejandro Ortiz, Psychology (U)</td>
<td></td>
</tr>
<tr>
<td>#7</td>
<td><em>The Effect of an Adaptive Attentional Bias Modification Program on Social Anxiety Symptoms</em></td>
<td>Rodolfo Rodriguez, Psychology (U)</td>
<td></td>
</tr>
<tr>
<td>#8</td>
<td><em>The Approach-Avoidance Task: Relationship between social anxiety symptoms and emotional facial expressions</em></td>
<td>Jesly Anne Avila, Psychology (U)</td>
<td></td>
</tr>
<tr>
<td>#9</td>
<td><em>The Effects of Coping Styles, Exercise, and Attention on Perceived Stress Levels in College Students</em></td>
<td>Samuel Plantowsky, Psychology (U)</td>
<td></td>
</tr>
<tr>
<td>#10</td>
<td><em>The Influence of Perceived Social Acceptance and Acculturative Stress While Abroad on Reverse Culture Shock in Study Abroad Participants</em></td>
<td>Jeremy Schonberg, Psychology (U)</td>
<td></td>
</tr>
<tr>
<td>#11</td>
<td><em>This Effect of Cognitive Bias Modification Interpretation Task on Subclinical PTSD</em></td>
<td>Nicole Brunn, Psychology (M)</td>
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### Session C-12

**Poster: Sociology**  
*Friday, March 4, 2016, 12:30 pm – 2:00 pm*  
*Location: Montezuma Hall*

<table>
<thead>
<tr>
<th>Poster #</th>
<th>Title</th>
<th>Author</th>
<th>Student Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>#13</td>
<td><em>Quantifying Plastic Debris Entering Our Waste Water Treatment Centers</em></td>
<td>Jannira Gregory, Environmental Engineering (M)</td>
<td></td>
</tr>
<tr>
<td>#14</td>
<td><em>Evaluation of the Biodegradability in an Anaerobic Baffled Reactor using Spectrofluorometry</em></td>
<td>Amy Bigelow, Environmental Engineering (M)</td>
<td></td>
</tr>
<tr>
<td>#15</td>
<td><em>Fluorescence spectroscopy as a tool to investigate the presence of organic contaminants in water reuse effluent</em></td>
<td>Azin Nour, Environmental Engineering (M)</td>
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<tr>
<td>#16</td>
<td><em>Swell Mitigation with Granulated Tire Rubber Packs</em></td>
<td>Ricardo Ramirez, Civil Engineering (U)</td>
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**Session C-11**

**Poster: Let’s Take Care of Our Water & Soil!**  
*Friday, March 4, 2016, 12:30 pm – 2:00 pm*  
*Location: Montezuma Hall*

<table>
<thead>
<tr>
<th>Poster #</th>
<th>Title</th>
<th>Author</th>
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<tbody>
<tr>
<td>#12</td>
<td><em>Evaluating the performance anaerobic baffled reactor coupled with a membrane for wastewater treatment using fluorescence spectroscopy</em></td>
<td>Joseph Wasswa, Environmental Engineering (M)</td>
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<tr>
<td>#17</td>
<td><em>Income Disparities Between White Alumni and Alumni of Color: A School of JMS Study</em></td>
<td>Kelly Lee, Journalism: Public Relations (U)</td>
<td></td>
</tr>
<tr>
<td>#18</td>
<td><em>Mapping Creativity Via Standardized Criteria</em></td>
<td>Emma Frivold, Psychology (U)</td>
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<tr>
<td>#19</td>
<td><em>Campus Sexual Assault: Rape Myth Acceptance and Reporting Among Victims</em></td>
<td>Nicole Meda, Psychology (U)</td>
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<tr>
<td>#20</td>
<td><em>Taking Further Steps To Prepare Undergraduate Social Work Students To Serve Culturally Diverse Populations</em></td>
<td>Kbrean Watkins, Social Work (U)</td>
<td></td>
</tr>
<tr>
<td>#21</td>
<td><em>Pronoun Use and Student Turn-Taking in Academic Lectures</em></td>
<td>Stephanie DeVera, Linguistics and Asian/Middle Eastern Languages (M)</td>
<td></td>
</tr>
<tr>
<td>Session C-13</td>
<td>Poster: Nursing</td>
<td>Friday, March 4, 2016, 12:30 pm – 2:00 pm</td>
<td>Location: Montezuma Hall</td>
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<tr>
<td>502 Poster #23</td>
<td><strong>IV insertion and Maintenance Infection Prevention</strong></td>
<td>Amy McGuinness, Nursing (U)</td>
<td></td>
</tr>
<tr>
<td>504 Poster #25</td>
<td><strong>Nursing attitudes toward physician-assisted suicide</strong></td>
<td>Anthony Interrante, Nursing (M)</td>
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<tr>
<td>505 Poster #26</td>
<td><strong>Buffering the Effects of Role Conflict on Strain: Personal and Contextual Moderators</strong></td>
<td>Noelle Devlin, Psychology (M)</td>
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<tr>
<th>Session C-14</th>
<th>Poster: Physical Therapy</th>
<th>Friday, March 4, 2016, 12:30 pm – 2:00 pm</th>
<th>Location: Montezuma Hall</th>
</tr>
</thead>
<tbody>
<tr>
<td>506 Poster #27</td>
<td><strong>Overground bionic ambulation in able-bodied individuals</strong></td>
<td>Brianna Swanson, Kinesiology/Pre-Physical Therapy (U)</td>
<td></td>
</tr>
<tr>
<td>507 Poster #28</td>
<td><strong>In-house validation of the Omron Automatic Blood Pressure Device</strong></td>
<td>Stephanie Coffin, Pre-Physical Therapy (U)</td>
<td></td>
</tr>
<tr>
<td>508 Poster #29</td>
<td><strong>Imposed expiratory flow limitation, hyperinflation, and dyspnea are dissociated from locomotor fatigue during moderate exercise</strong></td>
<td>Brooke Wickman, Exercise Physiology and Nutritional Sciences (M)</td>
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</tr>
<tr>
<td>509 Poster #30</td>
<td><strong>Differences in movement of the lumbar spine and lower extremities between people with and without low back pain during a pick up task</strong></td>
<td>Natalie D’Arpa, Physical Therapy (D)</td>
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</tr>
<tr>
<td>510 Poster #31</td>
<td><strong>Postpartum Diastasis Recti Abdominis: Treatment and Functional Implications</strong></td>
<td>Rose Schlaff, Physical Therapy (D)</td>
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<tr>
<th>Session C-15</th>
<th>Poster: Balance</th>
<th>Friday, March 4, 2016, 12:30 pm – 2:00 pm</th>
<th>Location: Montezuma Hall</th>
</tr>
</thead>
<tbody>
<tr>
<td>511 Poster #32</td>
<td><strong>Prevalence of Impairments, Pain, and Symptom Change with Impairment Modification using a Movement System Impairment Examination for Low Back Pain</strong></td>
<td>Grayson Arceo, Physical Therapy (D)</td>
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<tr>
<th>Session C-16</th>
<th>Poster: Business</th>
<th>Friday, March 4, 2016, 12:30 pm – 2:00 pm</th>
<th>Location: Montezuma Hall</th>
</tr>
</thead>
<tbody>
<tr>
<td>517 Poster #38</td>
<td><strong>Determination of Sustainability Preferences Among Craft Beer Consumers in San Diego County</strong></td>
<td>Larina Cassidy, Recreation and Tourism Management (U)</td>
<td></td>
</tr>
</tbody>
</table>
518 Poster #39
Appropriate Gift Giving: A Comparison Between China and the United States
Vincent Bellinghiere, Communication (U)

519 Poster #40
The Societal Implications of the American Millennials’ Savings Plan
Gareth Lintt, Management (U)

520 Poster #41
Starbucks
Nicholas Robbin, Marketing (U)

521 Poster #42
*Bikeshare and Transit in National City, CA: Implications for Climate Change, the Economy, and Public Policy
Jeremy McKinstry, Environmental Health Sciences (M)

Session C-16
Poster: Hispanic Health Issues
Friday, March 4, 2016, 12:30 pm – 2:00 pm
Location: Montezuma Hall

522 Poster #43
Neighborhood Income and Anxiety and Depression Symptoms among Hispanic Americans
Grecia Sanchez, Psychology (U)

523 Poster #44
Neighborhood Income and Health-Related Quality of Life in Hispanic Americans
Jose Valdez, Psychology (U)

524 Poster #45
Willingness to Use Hospice Care Among Caregivers of Rural Latino Patients
Stephanie Martinez, Social Work (M)

525 Poster #46
Change in depressive symptoms and food behaviors for Mexican American women participating in a culturally-tailored diabetes prevention pilot intervention
Kinsey Pebley, Psychology (M)

526 Poster #47
*Perceived Community-Level Violence and STI Prevalence among Mexican Female Sex Workers Who Inject Drugs
Nathan Alamillo, Public Health (D)

176 Poster #48
Capacitance in Capillary Electrophoresis
Adam Perez, Chemistry (U)

Session D: Poster Presentations

Session D-9
Poster: Medical Biotechnology
Friday, March 4, 2016, 2:15 pm – 3:45 pm
Location: Montezuma Hall

527 Poster #1
Developing a Dengue Virus-based Assay for the Identification of Novel Inhibitors
Juan Gadd, Biology (U)

528 Poster #2
A turning point for cancer: uncovering the differences in the behavior of the tumorigenic mutant IDH1 enzyme
Stacy Anselmo, Biochemistry (U)

529 Poster #3
Using Protein Design to Engineer the Cif Epoxide Hydrolase Enzyme for Neutralization of Mycotoxins
Courtney Scholl, Biology (U)

530 Poster #4
A High Throughput Approach to Drug Discovery for the Treatment of Multiple Sclerosis
Katharine Moore, Biology (U)

531 Poster #5
A Novel Screening Platform to Identify Drugs which Reprogram Pancreatic Cancer
Nicholas Villarino, Biology (U)

532 Poster #6
Creating novel, patient-specific, stem cell therapies for Hemophilia B via CRISPR/Cas9 gene correction
Kevin Green, Biology (U)
Session D-10

**Poster: Alcohol & Tabacco**  
Friday, March 4, 2016, 2:15 pm – 3:45 pm  
Location: Montezuma Hall

533 Poster #7  
*The relationship between cigarette smoking and self-reported perceived health among current daily smokers.*  
Dan Frumer, Sociology (M)

534 Poster #8  
*Sensitive Laser-Based Detection of Nicotine and its Metabolites for Second- and Third-Hand Smoke Studies*  
Filippo Venturini, Chemistry (M)

535 Poster #9  
*Binge Drinking Is Associated with Reduced Brain Indices of Emotional Processing and Memory Retrieval*  
Siyuan Huang, Psychology (M)

536 Poster #10  
Prenatal Alcohol Exposure is Associated with Impairments in Executive Function  
Meaghan O’Brien, Psychology (U)

537 Poster #11  
*Neural oscillatory dynamics underlying response inhibition is affected by binge drinking*  
Lee Holcomb, Psychology (U)

538 Poster #12  
The Effects of Binge Drinking on the Neurodynamics of Decision Making under Conditions of High and Low Response Conflict  
Stephen Cruz, Biology (U)

Session D-11

**Poster: Big Data Biology**  
Friday, March 4, 2016, 2:15 pm – 3:45 pm  
Location: Montezuma Hall

539 Poster #13  
*Insights into the Assembly of the Threonylcarbamoyl Adenosine (t^6A) Biosynthesis System*  
Sunjeet Baadkar, Biochemistry (M)

540 Poster #14  
*Who is there and what are they doing? Using FOCUS and SUPER-FOCUS for an agile taxonomic and functional analysis of metagenomic big data*  
Genivaldo Silva, Computational Science (D)

541 Poster #15  
*An Algorithm to Identify Anomalous Data in Big Data Generated by Air Particle Monitors*  
Dylan Petersen, Statistics (U)

542 Poster #16  
*Meta-kaks: a tool to measure natural selection strength on a metagenome*  
Vito Cantu, Computer Science (D)

543 Poster #17  
*Characterizing Unknown, Virally-Encoded Open Reading Frames from Metagenomic Data*  
Matthew Gallagher, Biology (M)

544 Poster #18  
*Global virome*  
Ana Georgina Cobian Guemes, Cell and Molecular Biology (D)

Session D-12

**Poster: Health & Alternative Medicine**  
Friday, March 4, 2016, 2:15 pm – 3:45 pm  
Location: Montezuma Hall

546 Poster #20  
*Effects of Meditative Breathing on Cognition*  
Christopher Czarnecki, Psychology (U)

547 Poster #21  
*Herbal Healing: A comparison of medicinal plant and pharmacy medication preference in two communities of La Libertad, Perú*  
Marisa Alvarez, Public Health and Latin American Studies (M)

548 Poster #22  
*Watermelon and L-Arginine Consumption Improve Serum Lipid Profile, Inflammation, and Oxidative Stress Profile in Rats Fed an Atherogenic Diet*  
Joshua Beidler, Nutritional Science (M)

549 Poster #23  
The Association between the Level of Physical Activity and Health Limitations  
Raquel Funches, Sociology (M)
550 Poster #24
The Effect Of Mitral Prosthesis Design and LVAD Support On Intraventricular Flow
Josue Campos, Mechanical Engineering (U)

551 Poster #25
Coastal Air-Sea CO$_2$ Exchange from the Scripps Pier in San Diego
Hannah Joss, Environmental Science (U)

552 Poster #26
Spatial Assessment of Ecosystem Impacts from Recreational Trails in the San Bernardino National Forest
Ian Crano, Civil Engineering (M)

553 Poster #27
Modeling hydro-geomorphic responses in the Waldo Canyon Fire
Samira Nourbakhshbeidokhti, Water Resources Engineering (M)

554 Poster #28
Investigating satellite-based evapotranspiration after wildfire in southwestern US
Patrick Poon, Civil Engineering (M)

555 Poster #29
*Ultra-long time prediction of reactive solute transport in geologic formations using spatio-temporal upscaling: theory and numerical experiments*
Farzaneh Rajabi, Mechanical Engineering (D)

556 Poster #30
*A General Multiscale Hybrid Method for Transport through Complex Porous Media*
Mehrdad Yousefzadeh, Mechanical Engineering (D)

557 Poster #31
Effects of Iconicity on Acquisition of American Sign Language in Adult Learners
Sara Campbell, Psychology (U)

558 Poster #32
My child is talking to me: animal assisted activities promoting pro-social behavior in children with autism
Nancy Diaz, Nursing (U)

559 Poster #33
Culturally Relevant Teaching: Special Education and Math
Cheyenne Raines, Liberal Studies (U)

560 Poster #34
Group differences in subtle head motion alter apparent findings from diffusion-weighted MRI
Seraphina Solders, Psychology (U)

561 Poster #35
The role of feedback and imagery (motor or visual) in sign language learning
Brittany Lee, Language and Communicative Disorders (D)

562 Poster #36
Expression and Purification of a Linear Tetra-Ubiquitin Protein for In Vitro Studies of IKK Activation
Garland Jackson, Chemistry/Biochemistry (U)

563 Poster #37
*Enhancement of Silicon Solar Cell Efficiency by Attachment of Silver Nanoparticles to the Cell*
Jasmine Lim, Chemistry (U)

564 Poster #38
*Investigation of a Redox-Responsive 4 H-Bond Array Capable of Strong Self-Dimerization*
Ghazwan Darzi, Chemistry (M)
Session D-16
Poster: San Diego County
Friday, March 4, 2016, 2:15 pm – 3:45 pm
Location: Montezuma Hall

567 Poster #41
The Economic Effects on Education within San Diego California School District: Education and Economic Injustice
Alflorence Knighton, Africana Studies (U)

568 Poster #42
Understanding the Significance of the Imperial Valley through Filmmaking and Photography
Daniel Rubio, History (U)

569 Poster #43
*Resource for the Ages: A History of Imperial Valley’s Tectonic Plate Activity
Marcie Rodriguez, History (U)

Session G: Poster Presentations
Session G-1
Poster: Medical Microbiology
Friday, March 4, 2016, 4:00 pm – 5:30 pm
Location: Montezuma Hall

578 Poster #1
A Mosaic of Microbes: Macro-organism Influence via Shedding and Induction Coral Reef Microbial Communities
Kevin Walsh, Ecology (M)

579 Poster #2
Investigating the Interplay between Chromosome Segregation, Recombination, and Phage in Salmonella Typhimurium
Greg Peters, Biology (D)
580 Poster #3
High-Throughput Prediction of Bacteriophage Structure Based on Genome Size
Diana Lee, Applied Mathematics (U)

581 Poster #4
Investigating the role of the LytR response regulator in Group B Streptococcal colonization and disease
Liwen Deng, Cell and Molecular Biology (D)

582 Poster #5
Global and Local Studies on the Evolution of crAssphage
Alejandro Vega, Biology (U)

583 Poster #6
Gap filling metabolic networks using physicochemical, sequence homology, and functional coupling evidence
Taylor O’Connell, Bioinformatics and Medical Informatics (M)

Session G-2
Poster: Antennas
Friday, March 4, 2016, 4:00 pm – 5:30 pm
Location: Montezuma Hall

584 Poster #7
*Design for Multimode Antenna using 3D Printing Technology
Alejandro Castro, Electrical Engineer (M)

585 Poster #8
Modified Miller Compensated Stable Non-Foster Matching Circuit from 600, MHz to 1100, MHz for a Bowtie Electrically Small Antenna
Ghanshyam Mishra, Electrical Engineering (D)

586 Poster #9
*Dipoles Supporting Multiple Unique Radiating Modes on Top of a High Impedance Surface
Mohana Vamshi Komandla, Electrical Engineering (M)

587 Poster #10
Corporate Fed 1x2 Linear Microstrip Patch Array on a Thick Substrate Material
Roshin Rose George, Electrical Engineering (M)

Session G-3
Poster: Applied Biochemistry
Friday, March 4, 2016, 4:00 pm – 5:30 pm
Location: Montezuma Hall

588 Poster #11
The Role of DNA Repair in the Control of the Retrotransposition Process
Brandon Everly, Biology (U)

589 Poster #12
Optimization of 5 PRIME Ready PCR DNA Card Kit Protocol for Environmental Samples
Annabelle Burruss, Environmental Sciences (U)

590 Poster #13
Metal Mediated Binding at a designed Protein-Protein Interface
Brian Maniaci, Chemistry (D)

591 Poster #14
Detecting Unlisted Steroids in Sports Supplements
Kelsey Berger, Microbiology (U)

592 Poster #15
Adaptation of a Cell-Based Assay for the Search of Novel Inhibitors of HIV-1 Envelope Cleavage
Darin Abbadessa, Cell and Molecular Biology (M)

593 Poster #16
*Development of Bio-Filtration Cartridge for Methane Mitigation.
Richard Hamilton, Biology (U)

Session G-4
Poster: Perception
Friday, March 4, 2016, 4:00 pm – 5:30 pm
Location: Montezuma Hall

594 Poster #17
HPV vaccination opinions gone viral: Quantified study looking at sentiment of tweets regarding HPV vaccine.
Pegah Chegha-Sabzi, Public Health (U)

595 Poster #18
Sensitive Detection of Biomarkers for Multiple Sclerosis Using Nonlinear Multi-Photon Laser Methods
Jie Liang, Chemistry (M)
596 Poster #19
How much is enough? Investigating the relationship between self-rated health and physical activity
Elizabeta Shifrin, Sociology (M)

597 Poster #20
Get Yourself Tested: An Assessment of a Sexually Transmitted Infection Prevention Program on Twitter
Caitlyn Carson, Health Promotion and Behavioral Science (M)

598 Poster #21
The Implications for Being Labeled a Follower Versus a Leader for Affect and Self-Esteem
Alexa Young, Industrial and Organizational Psychology (M)

Session G-5

Poster: Disparities: Health & Income
Friday, March 4, 2016, 4:00 pm – 5:30 pm
Location: Montezuma Hall

599 Poster #22
Community Matters: Neighborhood Factors and Health Locus of Control
Quinn Wilson, Psychology (U)

600 Poster #23
The Effects of Ethnicity, Social Support, and Age on Hiring a Health Care Advocate
Lauren McKinley, Psychology (U)

601 Poster #24
*Culture, cognition, and the locus of control among diabetes patients in the Imperial Valley
Geraldine Jovel, Psychology (U)

602 Poster #25
Do Old Age, Dementia, Depression, and Comorbidity Affect the Likelihood of Hiring a Healthcare Advocate?
Symone McKinnon, Psychology (M)

603 Poster #26
Demographic Predictors of the Likelihood of Hiring a Health Care Advocate for Physical and Mental Health Conditions
Mathew Mansoor, Psychology (U)

Session G-6

Poster: Alzheimer’s & Memory
Friday, March 4, 2016, 4:00 pm – 5:30 pm
Location: Montezuma Hall

604 Poster #27
A New Test of Destination and Source Memory
Emily Van Etten, Psychology (U)

605 Poster #28
C-Terminal Truncated alpha-synuclein may link Lewy Body Diseases and Tauopathies
Sarah Gough, Psychology (U)

606 Poster #29
Reconsideration of the “Cross-Race” Memory Bias
Taylor Lemker, Psychology (U)

607 Poster #30
Recall and Recognition Discriminability in Healthy Aging
Charles Moreno, Psychology (U)

608 Poster #31
Direct vs. Averted Eye Gaze as a Factor of Approach/Avoidance Behavior Beyond Cross Race Memory Effect
Lindsay Portney, Psychology (U)

609 Poster #32
Odor Discrimination in APOE-ε4 Carriers vs. Non-Carriers
Andrew Fiscella, Psychology (M)

Session G-7

Poster: Women’s Health
Friday, March 4, 2016, 4:00 pm – 5:30 pm
Location: Montezuma Hall

610 Poster #33
Cultural and biological models of reproductive health among migrant women
Gabriela Avendano, Psychology (U)

611 Poster #34
Do Cognitions and Quality of Life Predict Resiliency Among Breast Cancer Patients?
Bianca Ayscue, Psychology (U)
**Poster #35**

**Pregnant Women in Low-income Communities and Why Their Health is Lower Than Those in High-income Communities**

Aaliyah Goodie, Public Health (U)

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**Poster #36**

**Does Acceptance of Ones' Condition and Level of Distress Predict Emotional Well-being Among Breast Cancer Patients?**

Heather Kirchhoff, Psychology (U)

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**Poster #37**

**Birth Outcomes: The role of protective factors and racial experiences reported as stressful by African American mothers during pregnancy.**

Kristen Lacar, Psychology (U)

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**Poster #38**

**Chorioamnionitis and Vaginal Examinations in Labor**

Unja Kim, Nursing (M)

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**Session G-8**

**Poster: Water Biolog**

Friday, March 4, 2016, 4:00 pm – 5:30 pm

Location: Montezuma Hall

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**Poster #39**

**The invasive alga, Sargassum horneri, threatens coastal ecosystem function in San Diego**

Genoa Sullaway, Ecology (M)

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**Poster #40**

**Genomic characterization of four novel bacterial species isolated from Point Loma, San Diego**

Kristen Aguinaldo, Biology (M)

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**Poster #41**

**Characterization of E. coli in recreational waters of Sayulita, Mexico and possible implications for human and marine ecosystem health**

Susana Najera, Cell and Molecular Biology/Spanish (U)

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**Poster #42**

**A Longitudinal Survey for Phage-encoded Toxin Genes in the Sewage-impacted Environment Along the San Diego Coast**

Tess Condeff, Biology (U)

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**Session G-9**

**Poster: Hot Topics in Flames and Solar Energy**

Friday, March 4, 2016, 4:00 pm – 5:30 pm

Location: Montezuma Hall

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**Poster #43**

**Balboa Park Water Project**

Morgan Faber, Environmental Science (U)

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**Poster #44**

**Leaf Area Index of Drought Years and El Nino Precipitation Events Impacts Southern California Native and Non-Native Plants**

Brenda Garcia, Environmental Science (U)
Creative Arts Exhibits and Presentations

Friday, March 4, 2016
Sessions H and E
Session H: Creative Arts Exhibits

Session H-1

Arts Exhibit:
Visual Creative Arts
Friday, March 4, 2016, 9:00 am
Location: Montezuma Hall

628 9:00 am

(in)visibility
Molly Gabbard, Applied Design (M)
Kerianne Quick, Applied Design

This project was born out a desire to explore artistic collaboration through the unique qualities of various mediums and the practices that they follow. The goal of the group was to find common thematic elements within each person’s independent, media-specific practice and to express those ideas cohesively as a group. The group was comprised of four SDSU fine art graduate students and one professor. As a group we traveled to the mountains of North Carolina for an inspiring and focused residency at Penland School of Crafts.

What was discovered through extensive presentation, reading and mind mapping was that we had more in common than we could have initially guessed. On the surface the themes were different but as we dug deeper into the motivations and expressions of each artists, areas of overlap emerged. We would like to present these findings at the Student Research Symposium along with each member’s expression of these ideas within their independent practice; painting, ceramics and metals.

The ideas that we will be focusing on for the Student Research Symposium are duality and (in) visibility. The processes for each member’s contribution will vary and in addition to the artistic objects themselves, we will be exhibiting a mind map expressing the discussions and topics that informed our unified understanding.

629 9:00 am

Secret Words
Kaitlyn Fusco, Studio Art (U)
David Hewitt, Art and Design

There is a language that exists without effort, with a softness that can express emotions without spoken word or gesture. ‘The language of flowers’ is a communication tool that falls under the jurisdiction of cryptography. It is a language brought to life through the arrangement of flowers, and through a shared attributed meaning. Most cultures developed a language of flowers in the past, through actual physical flowers to representational ideals that they likened other things to. “As beautiful as a rose,” is a common sentiment, and it attributes the beauty of a flower to, more often then not, a person. During the 19th century, communication via flowers enabled coded messages to be sent to a chosen recipient. Flowers cross all eras, ages, and levels of society.

“Secret Words,” is an ongoing art series that focuses on the use of the symbolic language of flowers to express a hidden meaning within the art. The existence of a flower language has always drawn my interest, as I can understand the burden of trying to convey emotional messages by word of mouth, and have often found the task to be excruciatingly painful and often enough, little nuances of emotion can be lost along the way.

Within my body of work, I have developed a mixed media style that relies on the build up of layers to come together to show a cohesive story. Within this ongoing series, I use the research of flower meanings in this hidden language as inspiration to what I wish to convey. After I have selected and researched the appropriate flowers I wish to use; I develop sketches, take or select photographs, and use live models to design my art piece. I enjoy using multiple layers of media to emphasis several nuances in color, texture, and detail to create precise and focused works of art. I want the audience to understand the symbolic nuances of my art, so that they can observe the world around them and see the stories hidden in front of our very eyes.

630 9:00 am

Girl with Flower
Danni Bao, Art (U)
Eva Struble, Art and Design

Oil paint on 36 in X 48 Canvas

631 9:00 am

Caesurae
Kaiya Rainbolt, ART (M)
Sondra Sherman, ART

We sanitize painful social issues with language that has given up its depth, disassociating words and images from their true meaning to collectively consent to a reality where we can talk about, read about, watch, and listen to the most horrifying things and still sleep at night.

How can we participate in meaningful and productive dialogue about these issues when we are so detached? How do we become engaged enough to respond without being overwhelmed and rejecting that which is painful? These questions are significant both socially and personally, and have motivated me to create work inspired by my experiences with childhood sexual abuse.
The creation of an art object as a representation of a particular human struggle has the potential to span differences in experience, background, and culture, in a way that creates connection, generates empathy, and fosters understanding. A visceral response to an art object could promote engagement in a way that makes it easier to engage in dialogue about socially sensitive issues.

This body of work seeks to evoke this visceral response and restore depth to the language associated with the experience of childhood sexual abuse. The series of abstract sculptural forms represents emotions and outcomes specifically related to childhood abuse, which endure long after the physical trauma has ended. Emotions and outcomes such as: shame, isolation, helplessness, confusion, fear, violation, and traumatic memory. The depth of the language can be restored by the viewer’s visceral response to the piece.

The objects are made with materials that have an association to the personal, or the domestic: clothing, suede, mattress ticking, bedding, and animal hide. Materials are constructed into forms that help reflect the feelings they are trying to represent. For example, pieces are tufted in the way of furniture cushions to reference the body being treated as an object. Bodily forms are pierced, strung, and constructed to hang limp, reflecting helplessness and shame, mattress ticking is knotted and stained to reference confusion and fear.

Art that is vulnerable enough to engage with painful social issues can encourage others to be vulnerable enough to engage with them too.

632 9:00 am

Tactus Veritas—Touch Reality
Charlene Mosley, Studio Arts/German Studies (U)
Eva Struble, Art and Design

My current project revolves about our 21st century mass-media driven society and its relationship with the natural environment. In today’s world people are always connected. Our technological progress has opened up doors we would have never imagined a century ago. Cameras have become our new eyes and microchips have become our new portals to memory. We see in pixels and remember in gigabytes. Everywhere we go we take pictures. But what about nature? Have you ever smelled a purple orchid tree? What does the texture of soil feel like? Can you recount how many times you have passed by a hummingbird today? Have you ever seen a caterpillar turn into a cocoon, a cocoon turn into a butterfly? There is this natural energy surrounding us, but it is on standby; fading to the background of our busy lives.

I am inspired by people in my everyday surroundings; school, events, the bus, work, home, parks, beaches, creeks. I observe their behavior and sketch them wherever I can. In my free time, I hike and bike. Surrounding myself with plants and animals, I focus on retaining a connection to the natural environment, taking it in with all senses: touch, smell, taste, sight and sound. From there on my methodology is consistent. I use several sketches and photographs of people and plants, such as succulents, to fuse and collage a greater image consisting of organic and geometric shapes of all forms, values and colors. I enjoy painting with expressive brushstrokes, applying thick oil paint in a matter that feels as though I am sculpting on canvas. This has an animating effect on my work and presents an interesting surface quality. My intention as an artist is to capture the viewer’s attention with vivid imagery in a way that breaks them free of their daily routine/devices. I want the viewer to think about their relationship to natural surroundings with the hopes of making them realize through which lens they see reality and to take the moment to tactus veritas (latin for touch reality).

633 9:00 am

What’s Your Credit Score?
Moses Muturi, Painting and Printmaking (M)
Eva Struble, Art and Design

My work is focused around giving new life and meaning to discarded materials and objects, more specifically those that would be considered banal- products and by-products of modern society that have come to the end of their utilitarian value. With these deceptively simple, abundantly available, and often free materials initially made for a specific purpose and to serve a practical function, I challenge the idea that they have reached their demise once their original purpose is fulfilled. I go a step further and engage these offerings to elevate them to a place where they demand consideration as alternative art materials. I immensely enjoy the process of cutting, marking, joining, and manipulating these materials into surfaces or three-dimensional pieces that are teeming with cultural, geographical, and emotional underpinnings.

My work is often, but not limited to dimensional creations that lie between the flat illusionistic space of painting and the volumetric physical space of sculpture and involves experimenting with simulations of aged, decayed, and layered surfaces. This results in new iterations that tell a story and are a raw reflection of our cultural, commercial, and industrial environment.

To someone an aged or deformed surface may mean nothing, but to the artist it represents an untold, and unappreciated story. The colors, decay, layers of textures, and typography, all represent an energy that was applied by, in some form by humans (including the artist’s physical act of making), nature, and time. To the artist, this represents a latent raw energy that was all the time hidden within the banal material.
Session E: Creative Arts Presentations

Session E-1
Performing Arts:
Visual, Performing, Creative Arts and Design
Friday, March 4, 2016, 1:30 pm
Location: Montezuma Theatre

634 1:30 pm
Contact Improvisation—Moving Bodies Move Ideas
Nhu Nguyen, Dance (U)
Jess Humphrey, Dance

In recent years, many scholars and scientists have engaged in research to define and prove the developmental benefits of dance. Among many modern dance forms, contact improvisation (CI) is often believed to be an evolving system of movement research that enhances the human reflects through spontaneous physical contact between two moving bodies. Throughout my years of practice, contact improvisation constantly reminds me to return to my basic survival instincts, refine my proprioception, and enhance my kinesthetic intelligence. In this research, I am going to delineate how contact improvisation can be utilized as a mean to improve technical and formal dance training. Learning in contact improvisation naturally happens in the format of “jamming” — an open-ended inquiry between moving bodies through physical touch. In other words, the jam is a lab that fosters the embodied development of endless kinesthetic possibilities. Participants arrive at the jam with personal hypotheses and agendas, which are to be tested and explored through intuitive negotiations with gravity, momentum, and inertia. The outcomes of this practice include but are not limited to improvement in practitioners’ ability to recognize natural flow of movements, embodiment of a wide range of physical states — from energetic to meditative, embrace of physical disorientation, expansion of their movement vocabulary, better understanding in regard to the elements of physics at play, and refinement of natural instincts. The performance aspect of this research is designed to demonstrate the spontaneous and live negotiations between two moving bodies, often seen in a CI jam. Through this performance, my partners and I hope to exhibit our kinesthetic understanding and the quick exchanges that occur as we practice. The score, which acts as a general boundaries for the exploration, is to blur the line between the leading role and following role. We ask the question: “what if both movers could lead and follow at the same time?” and actively observe what arises. The audience will be providing the context for this dance and is invited to relate/make meaning/contribute in any way they desire.

635 1:50 pm
Not Just a Dancer: Vocal Warm Ups for the “Dancer Who Sings”
Jessica Humphrey, Musical Theatre (M)
Robert Meffe, Musical Theatre

In a recent interview for TheatreMania, current Fiddler on the Roof star and season 8 winner of Fox’s So You Think You Can Dance Melanie Moore recalls how she started getting noticed in New York; “Oh, she’s not just a dancer. She can actually sing!” the casting directors would say. This is the case for many dancers on Broadway, the ones that stand out are the ones that can sing, dance and act. It is important for a dancer to condition their voice just as much as their body in this new age of musical theatre.

Through my research, I have devised a short but effective warm up for dancers who are learning to sing. I will incorporate techniques and figures from the Estill Technique, Speech Level Singing (SLS), Bel Canto style, and Lessac Kinesenic Training in an onstage demonstration of this warm up performed by a dancer turned singer, along with explanation. All of these methods focus on producing a healthy sound and most develop the voice in a holistic way—incorporating the whole body much like a dancer would be used to. Exercises will focus on breath, resonance, flexibility of the voice, and engaging the support of the diaphragm. For a dancer especially, breath, flexibility and strength have different meanings in dance versus singing and it is important to understand and differentiate between the two. One a dancer understands the terminology, the point of the exercise and “feels” the effect, they will be successful in their warm up.

636 2:10 pm
The Strategy of Songwriting: Demonstrating Musical Influences in Just Pretend—A New Musical
Bradley J. Behrmann, Musical Theatre (M)
Robert Meffe, Musical Theatre

In creating a new work of musical theatre, a question typically posed to creators is “Which comes first, words or music?” In the case of the new musical Just Pretend by Bradley J. Behrmann and Orin Johnson, the answer is, “The story.” Based on the biblical Book of Esther, Just Pretend recounts the story of a young Jewish girl who rises to become Queen of Persia, conceals her heritage, and ultimately saves her people from the hands of a tyrant. For those of the Jewish faith, it is a tale told annually on the feast of Purim. Framing this story for Just Pretend is a play-within-a-play construct as the audience watches a troupe of young actors prepare and perform the Purim spiel. Since the creators exhaustively discussed the story of both “onstage” and “offstage” characters as well as outlined moments to employ song prior to writing a note of music or a word of lyrics, they are able to link those musical moments together in a subtle and
satisfying way. Furthermore, because the setting for the musical is both ancient and contemporary, the creators allow influences from not only the Jewish musical tradition but also from the musical theatre tradition.

Within this presentation, the author will cite musical moments within the show that draw from particular influences in the canon of musical theatre and also demonstrate how the creators’ detailed storyboard allows for an informed strategy in the composition of each musical number. Specifically, the author will examine the opening sequence—“Prologue & Grand Party”—and analyze ways it adheres to other expository songs and contrasts with that formula. In a similar manner, the makeover song—“Striking Gold”—and the villain song—“It’s Haman”—harken to other songs like it in both content and style. The titular Act I finale—“Just Pretend”—draws inspiration from epic Act I finales in structure, suspense, and conflict. Woven throughout these musical numbers is a thread of Hebrew tonality. This undercurrent bursts forth in the closing scene when the musical reprise of “Prologue & Grand Party” transforms into a traditional Purim folk song, “Chag Purim,” which the listener finds nestled into the now-familiar melody. In short, this presentation will demonstrate how strategy precedes songwriting.

637 2:30 pm
“I Believe in You”: Choosing Audition Material in Musical Theatre
Kikau Alvaro, Musical Theatre (M)
Robert Meffe, Musical Theatre

On January 21st, I auditioned for the San Diego State University’s production of The Drowsy Chaperone, which will be performed in March of 2016. I will be performing the audition material and then discussing why I chose the material for the specific audition. The performance will be of two songs, “I Believe in You” from ‘How to Succeed in Business Without Really Trying’ and “Me” from ‘Disney’s Beauty and the Beast.’ I will share how I researched the roles for which I have auditioned and the method of drawing connections between the archetypes from one musical theatre role to another. I would like to synthesize my research to help performers currently attending SDSU and those in the “real world” in an effort to bring together the academic and professional musical theatre communities.
3:30 pm

La Bamba Moderna: Making Traditional Music Relevant to Young Audiences

Gustavo Alcoser, Latin American Studies (M)
Marian Liebowitz, Music and Dance

In today's age of digital downloads and increasingly automated music, the role of traditional musical forms in Western societies is constantly being challenged. With the enthronement of Pop music, younger generations of Latinos are losing touch with the ways in which traditional musical forms represent their cultures and ethnicities. Our ensemble, Jarabe Mexicano, endeavors to act as a bridge between old and new musical forms in order to expand the minds and lives of young Latinos while inviting people of diverse cultures to also enjoy our musical fusion.

By revisiting popular songs, such as “La Bamba”, famously covered by the late rock-and-roll sensation Richie Valens, Jarabe Mexicano highlights the musical qualities and cultural roots that bind Valens’ version to the original, which stems from the fandangos of the Mexican state of Veracruz. While the rock-and-roll version may seem like a corruption of a traditional form, it exposed and reminded a whole new generation of diasporic peoples in the United States that their traditions were valuable and could contribute to mainstream culture and society.

Jarabe Mexicano addresses cultural remembrance by refreshing and maintaining older musical forms as well as setting them alongside newer ones. Additionally, we demonstrate music techniques while also employing call-and-response as well as rhythmic exercises that engage audiences young and old.
ABSTRACTS

Oral Presentations

Friday, March 4, 2016
Sessions A, B, C and D

Saturday, March 5, 2016
Sessions I and J
ABSTRACTS

STUDENT RESEARCH SYMPOSIUM 2016

Session A: Oral Presentations

100 9:00 am
Stigma towards addicts of different substances: A path analytic approach
Nathan Echols, Psychology (U)
Allison Vaughn, Psychology

Individuals with mental illness suffer from a high degree of public stigma. Of the mental illnesses studied, drug addiction is consistently found to be one of the most highly stigmatized. Previous research has found that the public often views individuals with drug addiction as responsible and blameworthy for their condition, resulting in devalued attitudes. To better understand this harsh stigmatization towards drug addiction, the aim of the current study was to investigate how the public’s stigmatization process is influenced by the substance to which the individual is addicted. A total of 304 participants were recruited from SONA’s undergraduate participant pool to complete an online survey using Qualtrics software for partial course credit. Participants were between the ages of 18 and 32 (M = 18.76). The sample was primarily female (77%) and had a fair distribution of ethnic diversity (44% Caucasian, 26% Hispanic, and 17% Asian). Participants answered questions about their perceptions, attitudes, and behavioral reactions towards individuals addicted to ten different randomly presented substances: Alcohol, Caffeine, Cocaine, Heroin, Marijuana, MDMA/Ecstasy, Methamphetamine, PCP, Prescription Drugs, and Tobacco/Nicotine. Two models of public stigma were investigated: the responsibility model which examines stigma through responsibility, anger, pity, and helping; and the dangerousness model which examines stigma through dangerousness, fear, avoidance, segregation, and coercion. Cluster analysis established three clusters based on perceived responsibility and dangerousness: Cluster 1 (low responsibility, high dangerousness: Alcohol, Cocaine, Heroin, Methamphetamine, PCP), Cluster 2 (low responsibility, moderate dangerousness: MDMA/Ecstasy, Prescription Drugs), and Cluster 3 (high responsibility, low dangerousness: Caffeine, Marijuana, Tobacco/Nicotine). Path analyses were used to examine model fit for each substance. The responsibility model fit well for the cluster of substances which were rated low in responsibility and high in dangerousness (Cluster 1) as well as for Prescription Drugs. The responsibility model did not fit well for the remaining substances. The dangerousness model fit moderately well or well for all of the substances. The standardized pathway coefficients for each model are specified within the results. These findings provide insight into the process of stigmatization, especially as it relates to drug addiction. Implications for interventions aimed at reducing stigma are discussed.

101 9:15 am
Social Change Index (SCI)
Trisha Hall, Hospitality and Tourism Management (M)
Lori Sipe, Hospitality and Tourism Management

About the Project: Over the past century, marketers and advertisers have applied the view that consumer behavior reflects informed and rational choice. To bridge traditional thinking and recent findings about what influences behavioral choices at the individual level, and social change at the collective level, I am developing a Social Change Index. The Index is a composite measure of communication influences on behavior and social change, combining traditional metrics such as message reach and awareness with newer, advanced measures of social interaction. The purpose of the Index is to provide a more comprehensive and therefore accurate methodology to track and predict a communication campaign’s ability to effect real social change. The methods: First, I initiated a research process looking into how marketing and advertising impacts social change. This process was broken into four phases: discovery, creation, testing and implementation. I reviewed current work being done in the area of behavior and social change. Once the initial SCI Index was created, it was tested against a mental health organization that had baseline primary research for through three years of data. Through this process, the index evolved and research teams were utilized to make the numbers statistically viable. Essential results: Now we have a working model for measuring organization’s past, current and potential campaigns impact on a specific community. This model helps organizations measure their communication efforts as it relates to a social change campaign, provides stronger accountability for media and advertising campaigns that are funded by tax dollars, and allow organizations to plan annually with a consistent understanding of the effective the advertising efforts are pacing to the ultimate goal of behavior change. Conclusion: Any social good campaign can take a baseline no matter what stage the campaign is in. Within 12 months of communication and advertising activity, research and metrics can allow the client to determine the rate of change the agency is able to effect with their communication campaigns. Later versions of the index will include predictive elements and store the early data to build predictive models within one year.
Background: Driving under the influence (DUI), defined as driving with a blood alcohol concentration (BAC) of .08 or higher (Blincoe, Miller, Zaloshnja, & Lawrence, 2015), is a national public health concern. In 2010, DUI vehicle crashes resulted in 11,226 deaths and 326,000 nonfatal injuries, accounting for $43.2 billion in costs to society (Blincoe, et al., 2015). Higher BAC puts drivers more at risk and is related to greater severity of alcohol problems (White & Gasperin, 2007). DUI rates among women increased by 20.9% nationally between 2002 and 2012 (FBI, 2013). Due to this increase, examining relationships among potential factors contributing to BAC among women may provide insight into treatment needs for this population. The present study investigates interrelationships among trauma events, post-traumatic stress disorder (PTSD) symptoms, self-reported parental alcohol misuse, depression, and anxiety as predictors of BAC among female DUI offenders. Methods: This study is a secondary data analysis of 215 female DUI clients. Data were collected during interviews with counselors and entered into a computer-based system. Assessment measures include trauma events (LEC-5), PTSD (PCL-C), alcohol use (AUDIT-C), parental alcohol misuse, mental health symptoms, and demographic variables with BAC as the dependent variable. Analyses included bivariate and multivariate methods including Path Analysis. Results: All path coefficients were significant at .05 level. Race (.225), depression (.214), and marital status (.226), independently related to BAC. Depression was the determinant of BAC related to other factors. Anxiety (.442) and PTSD (.258) predicted depression. PTSD (.260) and age (.144) predicted anxiety. Trauma (.502) and age (.132) predicted PTSD. Paternal (.208) and maternal (.173) alcohol misuse predicted trauma. Outcome: As predicted, interrelationships among trauma, PTSD, parental alcohol misuse, depression, and anxiety exist in a positive direction. Surprisingly, being Caucasian was independently positively related to BAC which may be attributed to differential policing. Nonetheless, female DUI clients present with significant trauma, PTSD, and mental health issues and BAC may serve as a proxy measure for self-medicating symptoms. Given these findings, it is critical for DUI counselors to assess and provide referrals for mental health concerns to reduce alcohol use and potential DUI recidivism.

Purpose: E-cigarettes are a potential pathway to nicotine dependence and combustible tobacco use among never smokers, but are often marketed as a healthy alternative to smoking cigarettes. Currently, e-cigarette advertisements are not required to display any standard warning label communicating their potential risks and harms. As such, consumers may have considerable ambiguity about the harms and benefits of e-cigarettes. While research has indicated that exposure and receptivity to e-cigarette marketing influences product use, no work has examined the extent to which this ambiguity about the harms and benefits of e-cigarettes leaves consumers vulnerable to the effects of e-cigarette marketing. This study addresses this gap and seeks to understand the interrelationships between: (a) e-cigarette use perceptions (b) prevalence and degree of attitudinal ambivalence regarding e-cigarette use, and (c) exposure and receptivity to different e-cigarette messages and their effect on the above-mentioned constructs. Methods: College students enrolled in a large, public Southwestern university participated in the study. As part of a randomized, controlled experiment, participants randomly assigned to pretest—posttest condition or posttest only condition. were exposed to one of the e-cigarette message conditions: (1) message argument supporting possible health benefits of e-cigarette smoking, (2) message argument highlighting negative health outcomes associated with e-cigarette smoking, (3) conflicting message with one argument each for benefit and risks of e-cigarette smoking (the order of the benefit and risk arguments was rotated as well). Results: The effects of exposure to each ad condition on e-cigarette perceptions and attitudes will be reported. Conclusions: The findings of this research yield actionable insights regarding actions the Food and Drug Administration could potentially take regarding e-cigarette advertising and risk and harm labeling. This study’s findings on the role of conflicting health information and attitudinal ambivalence can also inform communication for other products such as prescription drugs, marijuana, or food.
104  10:00 am

**Drug Avoidance Self-Efficacy among Cannabis-Only Users and Other Drug Users Who Visit the Emergency Department**

Sarah Clingan, Substance Use (D)
Susan Woodruff, Social Work

**Background:** Medical care in the emergency department (ED) is one of the most rapidly growing, complex areas of outpatient care, with about 209 visits made to emergency departments every minute in 2004. Studies report that, compared to non-drug users, illicit drug-using individuals are more likely to use the ED for their medical care and are more likely to require hospitalization. Self-efficacy has been shown to be predictive of positive outcomes in areas such as education, weight loss, and sports performance.

Self-efficacy has also been shown to be a predictor of abstinence or reduced use among drug-using individuals. Objectives: The current study describes drug avoidance self-efficacy among drug users who use the ED for any reason. Methods: Participants were 693 adult patients visiting the trauma units and EDs of two large urban “safety net” hospitals in Southern California who reported using illicit drugs in the past 30 days. Results: After controlling for race, gender, education, work status, marital status and income, for cannabis-only users higher drug avoidance self-efficacy was associated with older age, lower drug involvement scores, higher alcohol severity scores (marginal), lower drug severity scores, lower psychiatric ASI scores (marginal) and higher readiness to change use. The model was significant, \( F = 8.87, p < .001 \), and over 30% of the variance in self-efficacy scores were explained by the model. For other drug users, after controlling for race, gender, education, work status, age, and income, higher drug avoidance self-efficacy scores was related to being in a relationship, lower drug severity scores, lower psychiatric severity scores, higher medical severity scores, and higher readiness to change use. The model was significant, \( F = 7.30, p < .001 \), and over 34% of the variance in self-efficacy scores were explained by the model. Conclusion: The current study identified several factors related to higher drug-avoidance self-efficacy that were common for both cannabis-only and other drug users; although the pattern of prediction was somewhat different for the two groups. Results may be important when designing intervention protocols.

411  10:15 am

**Examining the Relationship of Racism to African American Acculturation and Social Desirability**

Konnor McMillen, Psychology (U)
Vanessa Malcarne, Psychology

**BACKGROUND:** Racism has proven itself to be resilient in American society. Previous research revealed that although we believe we live in a “post-racial” society, discrimination still exists and is harmful in many ways. African Americans face discrimination in the criminal justice system, housing, education, career and employment opportunities, socioeconomic status, and health care. Studies have shown that racism leads to significantly worse mental and physical health in African Americans, including depression, anxiety, weight gain, and cardiovascular risk. Research has also suggested that racism can lead to adverse outlooks on one’s own culture, although this has not been extensively studied in African Americans.

**METHOD:** Participants were 432 self-identified African American adults (34% men, 66% women) from San Diego County. The current study uses scores from three scales drawn from the larger study: the Schedule of Racist Events, the Marlowe-Crowne Social Desirability Scale, and the African American Acculturation Scale-Revised. A hierarchical multiple regression analysis will be used to analyze the data. **RESULTS/FINDINGS:** It is hypothesized that increased experienced racism will be associated with higher levels of acculturation, based on the notion that experience with racist events will drive African Americans to adopt a traditional “White society” mindset. Social desirability is expected to act as a moderator between racism and acculturation, such that African Americans that experience racism and are high in social desirability will show the highest levels of acculturation.

**CONCLUSION:** The current study aims to add to the wealth of literature regarding the effects of racism. Expanding past research, the present study will focus on the relationship of racism to African Americans’ acculturation, and consider how social desirability may influence this relationship. From this study, researchers should understand how racism is associated with African American acculturation, and if social desirability moderates this relationship.

**Session A-2**
**Oral Presentation:** Identities & Representations
**Friday, March 4, 2016, 9:00 am**
**Location: Park Boulevard**

105  9:00

**Spoken But Not Heard: The Role of Pragmatics in SMS Communication**

Hari Buenfil, Linguistics (U)
David Kamper, American Indian Studies

This research project explores how misunderstandings occur via SMS communications given the challenges presented in understanding the linguistic concepts of intention and competence within the format of texting. Our analysis is comprised of a comical example of an unsuccessful SMS communicative event wherein context and intention are absent,
and we attempt to establish a correlation between these missing attributes and the ensuing communication breakdown. The speech act that we use as a prototype for SMS communication breakdown comes from the Key & Peele Show on Comedy Central and depicts two men attempting to confirm plans via text message. While it is important to note this is not a naturally occurring speech act but a scripted and prerecorded one whose intention is to entertain and whose primary focus is comedic, we nonetheless feel that this script is highly illustrative of common ways that communication breaks down in SMS.

106 9:15 am

Music and Social Justice: Examining the Effect Music has on Sustainable Behavior
Linda Murillo, Social Work (U)
Vinod Sasidharan, Hospitality and Tourism Management

This study attempts to further expand our understanding of how music helps promote sustainable behavior among individuals that engage in music, including both playing and listening to music. Today, there are many avenues to promote sustainable behavior and social issues. However, the way music helps to promote sustainable behavior has not been thoroughly studied. The few studies that have been conducted on this topic have shown that music has a positive impact on its participants in terms of activism in social justice and social causes. However, not everybody is affected in the same way since individuals engage with music differently and for different amounts of time. Additionally, individuals actively engaged in music also determine the collective identity they fit into through music. The relationships within these collective identities reflect the complexity of doing things together and, when the music or collective identity advocates for a social cause, the participant is influenced to support it. A person’s musical choice affects the individual’s collective identity, whereas the amount of time a person spends on music also affects the influence music has on the individual’s sustainable behavior. In this study, a self-administered questionnaire was provided to students majoring in Music as well as those from other disciplines at San Diego State University. The survey included questions concerning the respondent’s music engagement and the influence music had on their participation in social justice and sustainability causes. Analysis of the data found an inconsistent degree of influence music had on each individual due to the differing musical background of each person. The influence was consistent among people that played similar instruments. Findings from his study will benefit groups of people advocating for collective change through the utilization of music to express their opinion on a social cause or sustainability issue to the world.

107 9:30 am

International Norms and the Woman’s Voice
Leah Schroeder, International Security and Conflict Resolution (U)
Cheryl O’Brien, Political Science

United Nations Security Council Resolution 1325, on women, peace and security, acknowledged for the first time in history the vital role women hold in the prevention of, during, and peacebuilding post-conflict. The resolution recognizes policies, civil society action and government cooperation necessary to increase women’s participation and equality in all aspects of life, and create space and opportunity for women to more easily access these roles. For example, states signed on to the resolution were encouraged to create and implement National Action Plans addressing these issues with policies such as quotas for female representation in governments and parliament, and the formation of institutions specifically working toward women’s rights and equality in social, political and economic matters. My research on this matter includes collecting and analyzing quantitative and qualitative data for specific countries, researching scholarly and peer reviewed, government, NGO and civil society documents regarding UNSCR 1325 and groundwork implementation done in these areas, compiling a report for each country, as well as interviewing relevant contacts in the area within civil society organizations and institutions. I will present a portion of the research I've accumulated regarding the implementation of this resolution in the specific areas of my focus, its effects, and any findings of resulting changes in the treatment, inclusion and expansion of women’s rights in the past 15 years relating to the creation of international human rights norms that address women’s issues. My areas of focus are Rwanda, Burundi, and the Great Lakes Region of Africa as a whole. As a research assistant for Professor Cheryl O’Brien, I became involved with the organization Femmes Africa Solidarité (FAS), a transnational feminist Non-Governmental Organization based in Africa. My involvement with FAS lead to the research done on my countries, assigned to me by O’Brien along with the Interim Director of FAS. She asked O’Brien, and possibly student research assistants, to collaborate with her with the purpose of compiling a report documenting the organization’s and other’s work within these regions concerning women, peace and security. Our final report is to be used by the organization and possibly displayed on FAS’s website.
**ABSTRACTS**

**108  9:45 am**

*Doppelgängers: Their Impact on Creative Works and Our Real Lives*

Madeline Barnes, Humanities (U)
Maria Rybakova, Classics & Humanities

Doppelgängers, an apparition or double of a living person, have been a unique mythological figure in creative works. One constant aspect that is shared between the various versions of the motif is the fear that is attached with the name of doppelgänger. By reading and analyzing ten prominent works with the doppelgänger theme, starting with the novel *Siebenkäs* by Jean Paul who is owed the credit of coining the term doppelgänger and ending with a realistic episode of the popular show *Doctor Who*, I was able to discover a similar pattern through each one. In each story, the doppelgänger does not perform a task that is beyond the human ability. Even if the act is violent, repulsive, or otherwise not aligning with what is considered to be human, they are acts that are within human limitations. Typically, the doppelgänger is performing an act that is seen as vile which is why we as observers are able to view the doppelgänger as monstrous or separate from ourselves. This being said, there is a reason that the doppelgänger takes on our own shape. Using books dating back to the eighteenth century as my basis, I have drawn the conclusion that the motif of the doppelgänger was conceived and persists because of the unwavering fear that humans possess of their own nature.

**109  10:00 am**

*Is the Medium The Message in Political Organization Public Relationships?*

Kalyca Becktel, Public Relations (U)
Kaye Sweetser, Journalism and Media Studies

In 1964, Marshall McLuhan coined the term “the medium is the message,” suggesting that the channel through which one communicates may indeed become the message itself. Looking through the lens of public relations, which emphasizes the relationship developed between an organization and its publics, this study advances relationship and medium theories to explore if the medium is the message in a digital political public relations context. This study employed a posttest-only experimental design with control group (N = 202) to empirically explore whether there was a difference in political organization-public relationship (POPR) based on the channel through which the candidate communicated.

**H1:** Communication channel impacts POPR.

**H2:** Communication channel impacts perceived credibility of the candidate.

Using the 2016 presidential election, this exploratory study tests the effect of the campaign PR channel (campaign press release, campaign blog post, campaign video) as an independent variable on POPR with the candidate as a dependent variable. The three-cell experiment with a control group focuses on the first-time voter to better understand POPR for those new to the political process. To test whether there was an impact on POPR based on channel, three relationship maintenance strategies factor scores were compared across all the experimental cells using analysis of variance. Only a single factor, the *Conversational Voice*, resulted in main effects, $F(3, 194) = 7.21, p < .001$. A Tukey post-hoc test revealed the control group reported statistically significantly higher *Conversational Voice* factor scores than those who saw the blog post ($M_{diff} = .60, p < .01$) and those who saw the press release ($M_{diff} = .79, p < .001$). Taken together, this indicates that the text-based channels result in lower POPR for *Conversational Voice*. Given these findings, H1 was partially supported for the *Conversational Voice* factor only.

To test whether there was an impact on credibility of candidate based on channel, the relationship maintenance strategies factor scores were compared across all the experimental cells using analysis of variance. The ANOVA for credibility showed no main effects. H2 is rejected.

This outcome concludes that traditional public relations material may degrade the constituent-candidate relationship.

**110  10:15 am**

*“Bring someone new and dance for free!”: Survival of Post-Modern Balkan Folk Dance Villages*

Jasmine Arpagian, Geography (D)
Stuart Aitken, Geography

Imagine walking into a room of three dozen people, some dressed in intricately embroidered “peasant” shirts and leather shoes, dancing the Bucimis horo (Бучимис хоро) in perfect unison while singing along with the band’s gadulka player. We are not in Sliven or Burgas, Bulgarian cities in the horo’s region of origin. Rather, we walked into a dance center in San Diego, a school gym in Ann Arbor and the meeting hall of a veterans’ organization in Detroit. This presentation will ultimately address the folk dance community’s struggle for survival and is informed by a geographic post-modern framework, drawing on theories about the production of spaces, representation and simulation. Methods used in this exercise include recounting conversations with dancers, reviewing threads posted on the East European FolkLife Center’s listserv (the most prominent online forum for folk dancing) and joining hands to dance. The strong sense of community is cited frequently as the primary reason participants choose international folk dancing as their exercise and recreation. Many dancers refer to their clubs as their village, a space they...

Student Level: (U)=Undergraduate; (M)=Masters; (D)=Doctoral
produce through their interactions, relations and dancing and which could be reproduced across the country in a variety of venues. Despite an initial impression of flexibility, this space is in fact rigidly constructed and semi-permeable. An emphasis on “authenticity” rigidly closes off this space. Dance clubs simulate an imagined understanding of villages and rural life, with members donning folk costumes every week while villagers may wear their traditional dress once in a while for special occasions. Closing off space to maintain authenticity and, according to some dancers, a representation of bygone homogeneous and communitarian villages alienates newcomers. This closure may slowly halt the production of these spaces.

291 10:30 am

*Lunfardo: A Contemporary Study of “porteño” Spanish*
Adriana Moosekian, Spanish (M)
Alfredo Urzua, Spanish

This investigation explores the Argentinian Spanish variety known as Lunfardo, among Argentinians aged 18–82 in the greater area of the Rio de la Plata. While Lunfardo is exhibited in texts that have served to record this lexicon as of the late 19th and early 20th Centuries, its sources are sparse in demonstrating its contemporary use. This diachronic analysis compares historic Lunfardo represented in 20th Century popular literature and music, to primary data of modern-day Argentinian subjects collected in a three-part survey in order to determine Lunfardo’s presence among contemporary speakers.

This study comprises two principal parts: First, a corpus of texts was formed in order establish a baseline representation of Lunfardo terminology as it existed throughout the 20th Century, drawing from authentic Argentinian texts of various genres. Second, a survey was created for Argentinian language informants in order to determine the extent to which they recognize such Lunfardo terminology, and how they perceive this variety’s presence and relevance in Argentinian Spanish today.

This reconnaissance fieldwork from December 14th to December 31st of 2015 informed current research of Lunfardo’s presence among contemporary speakers. This study was to improve lactic acid production by constructing novel metabolically engineered *M. alcaliphilum*. That could be achieved via a heterologous expression of an inducible NADH-dependent lactate dehydrogenase (LDH) enzyme. The *ldh* gene will be introduced into *M. alcaliphilum* (acetate auxotroph) using bi-parental mating with *E.coli* harboring pCAH01 plasmid [Henard et al., Sci Rep 2016]. The conversion of methane will be done in two stages: [1] accumulation of active cells (the catalyst generation); and [2] switch to non-growing condition to maximize methane to lactate conversion.

113 9:30 am

*Screening for Indicator Species of Changing Coral Benthic Communities*
John Haggerty, Ecology (D)
Elizabeth Dinsdale, Biology

Coral reefs are under a state of increasing microbialization as corals and large fishes are replaced with algae and microbes (Bacteria and Archaea). Change in benthic community structure...
correlates to an increase in opportunistic pathogens and subsequently higher rates of coral disease. To address the influence of benthic organisms on opportunistic pathogens of the water column, water column borne microbes were exposed to the effluence of benthic organisms (coral, algae, CCA and water control) before being screened with a nutrient rich media to select for eutrophs common in diseased organisms. Composition of the water column microbial community was significantly altered by the screen, selecting for a common opportunistic group of pathogens, *Vibrio* and *Arcobacter*. Coral treatments significantly increased the proportion of the opportunists *Arcobacter*, and algae increased the proportion of *Vibrio*. These rare species in the water column are associated with tissue of diseased coral. The screen selected for only eutrophic microbes so whole genomes could be reassembled from DNA fragments. Genomes showed *Vibrio* and *Arcobacter* have distinct metabolic genes defining adaptive characteristics. Performing microbial screens identifies rare, but potentially ecologically important microbial species and how benthic members of the community are contributing to the microbialization of coral reefs.

**114 9:45 am**

**The power of microbes: Microbial bioenergetics of coral-algal interactions**

Ty Roach, Cell and Molecular Biology (D)

Forest Rohwer, Biology

Coral reef ecosystems are transitioning from coral to algal-dominated states on a global scale. Thermodynamic theory predicts that as these systems undergo this transition they will optimize their components to maximize power output. Thus, we hypothesize that perturbed areas far from steady-state such as the coral-algal interface will harbor microbial communities optimized to maximize their thermodynamic power output. To test this hypothesis, we used a novel combination of methods to provide a bioenergetic analysis of interaction zones. This study reveals that the energetic demands of microbial communities at the coral-algal interaction interface are higher than in the communities associated with either of the single organisms. This is evident through a) higher microbial power output, and b) lower oxygen concentration at interaction zones compared to areas distal from the interface. Increase in microbial power output is significantly correlated with the ratio of heterotrophic to autotrophic microbes but not microbial cell abundance. Finally, microbial metagenomes, metatranscriptomes and sizing generated from coral-algal interactions suggest that an increase in average microbial size coupled with a shift from efficient glycolytic pathways towards faster, less efficient alternative catabolic pathways is responsible for the change in power output. Together these data suggest that coral-algal interfaces harbor higher proportions of heterotrophic microbes that are optimized to maximize the power output, as opposed to yield. This yield to power shift provides a thermodynamic mechanism underlying the global microbialization of coral reefs.

**115 10:00 am**

**From DNA to FBA: how to build your own genome-scale metabolic model**

Daniel Cuevas, Computational Science (D)

Robert Edwards, Computer Science

Microbiological studies are increasingly relying on *in silico* methods to perform exploration and rapid analysis of genomic data, and functional genomics studies are supplemented by the new perspectives that genome-scale metabolic models offer. A mathematical model consisting of a microbe’s entire metabolic map can be rapidly determined from whole-genome sequencing and annotating the genomic material encoded in its DNA. Flux-balance analysis (FBA), a linear programming technique that uses metabolic models to predict the phenotypic responses imposed by environmental elements and factors, is the leading method to simulate and manipulate cellular growth *in silico*. However, the process of creating an accurate model to use in FBA consists of a series of steps involving a multitude of connections between bioinformatics databases, enzyme resources, and metabolic pathways. We present the methodology and procedure to obtain metabolic models to predict the phenotypic responses imposed by environmental elements and factors, is the leading method to simulate and manipulate cellular growth *in silico*. However, the process of creating an accurate model to use in FBA consists of a series of steps involving a multitude of connections between bioinformatics databases, enzyme resources, and metabolic pathways. We present the methodology and procedure to obtain a metabolic model using PyFBA, an extensible Python-based open-source software package aimed to provide a platform where functional annotations are used to build metabolic models. Backed by the Model SEED biochemistry database, PyFBA contains methods to reconstruct a microbe’s metabolic map, run FBA upon different media conditions, and gap-fill its metabolism. The extensibility of PyFBA facilitates novel techniques in creating accurate genome-scale metabolic models.

To date, fifty-eight diverse bacteria have been sequenced and annotated to generate metabolic models using PyFBA. Additionally, these bacteria have been grown on up to 192 different minimal media compositions and analyzed using the pmAnalyzer pipeline (growth curves available from http://edwards.sdsu.edu/dbbp). These experiments supplement FBA predictions by creating a feedback system that optimizes and reconciles each metabolic model. By linking a microbe’s genotype to its phenotype, a new methodology combining phenomics with genomic annotations enables predictions of gene-protein-function connections not yet explored by traditional bioinformatics approaches.
to engineer biological systems reliably and predictably. We conducted a two-coder coding and document analysis on the New York Times news reports about synthetic biology from 2005 to 2015. Through this analysis, we identified certain patterns in the reporting. First, we found that within one article there were contradictory and mixed messages about how to define the field and ethical issues. Secondly, we found there was a lack of sense of urgency in regards to the need for public debate about synthetic biology. Synthetic biology was portrayed as a promising and novel, new technology. However, at times it was also presented as not that much different than what the scientists have been doing so far with genetic engineering. In many articles, the public was given reassurance that the development and application of synthetic biology is under scientists’ control, and that the best course of regulation is for the field to self-govern and self-regulate. Overall the conversation surrounding synthetic biology shows a lukewarm attitude. Although the research and application of synthetic biology is an ongoing project, previous studies show that the conversation about ethics in and about the field is either underrepresented or underdeveloped in public discourse. This may be why in searching for a dominant frame regarding synthetic biology in news reports, the result is somewhat inconclusive. We as researchers suggest that the vagueness of synthetic biology—in its definition, public attitude, self-presentation and media portrayal—potentially exempt the scientists from ethical responsibilities and regulations. This study calls for further investigation and follow-up on public opinions about synthetic biology in order to better understand and have conversations about the potential implications and impacts of synthetic biology as a growing new field in biotechnology.

118  9:15 am

**Fusion Carnavalesque — the Semiotics of Gender Play in Steven Universe**

Susan Shamoon, Children’s Literature (M)

Phillip Serrato, English and Comparative Literature

Cartoons aimed at young audiences have recently undergone a shift toward more inclusivity, with shows like*Adventure Time* and *The Legend of Korra* leading the way for more queer visibility. However, even this representation of queer characters is largely confined to un-canonical gay and lesbian relationships in children’s cartoons. Invoking the work of Judith Butler, this paper investigates how the popular show *Steven Universe* radically deconstructs this tradition and gives a voice to less represented trans, genderqueer, and agender identities with its unique concept of magic fusion as the specific key narrative technique. I argue that this is achieved because *Steven Universe* utilizes the inherent suspension of belief within the fantasy genre, and so, when the characters’ change their gender presentation through magic, it disconnects notions of perceived gender norms from gender identity in the viewer’s mind.
119  9:30 am

“Manhattan” Shaping Public Memory: The Television Show “Manhattan” presented as a Public Memory Site

Ana Aguila, Master of Arts in Liberal Arts and Sciences (M)
William Nericcio, English and Comparative Literature

Using the television show “Manhattan” as a public memory site, I investigate how its perception of The Manhattan Project in the 1940s is currently shaping public memory. Through a pacifist interpretation, “Manhattan” leads its audience toward moral questions on the invention of the first atomic bomb, casting doubt on its deployment and therefore, abandoning the popular conspiracy theories and mysterious aura surrounding the infamous Manhattan Project.

Focusing on episode three from season two, this study intends to demonstrate how the series is changing the viewer’s opinion on the creation of the atomic bomb to a more peaceful point of view rather than the common shadowy belief. I will first examine the television show’s general plot and the main episode used for this study, followed by a brief recount of season one, which reinforces pacifist views on past wars. Then, I will explore episode three by asking a series of questions dealing with dominant narratives, their construction and relation with the past and present, as well as their rhetorical effect on the viewer. The goal of the presentation is to demonstrate how the television show “Manhattan” is changing people’s popular and mysterious-pro-war opinion of the creation and use of the Atomic bomb to a pacifist point of view filled with moral dilemmas and doubt.

120  9:45 am

She’s So Unusual: Women Self-fashioning as Artists and Changing the Dialogue on MTV

Sherry Boulter, History (M)
Eve Kornfeld, History

Hairspray, tight pants, and rock and roll, but that was primarily the men on MTV. While men represented approximately 90% of the artists aired on MTV, the women that entered the male dominated medium created a different dialogue on the channel that was both meaningful and visually appealing. This study argues that female artists used self-fashioning to create personas that enabled them to visually represent women in the 1960s and 1970s. These decades were a period of intense debate about the presence of women surfers within the culture. Through surf magazines, women participated in the subculture while facing discrimination from their male counterparts. This study argues that magazines like Surfer Magazine presented contradictory views of women’s participation in surf culture in 1960–70s Southern California. While casually printing images and stories of individual women who surfed, they also repeated and enforced damaging gender stereotypes about the proper behavior and appearance for women. Within this male-dominated medium, women expressed dissatisfaction with and contested their subordinate position through writing and interviews. Women surfers in the 1960s and 70s found themselves in a liminal space between begrudging acceptance and outright hostility and fought for a space for themselves built on mutual respect.

In the study, where and how women are (or are not) placed in letters, images, and articles in Surfer Magazine during the 1960s and 1970s is deconstructed using a combination of visual analysis, textual analysis, and post-structuralism. These methods are also used to analyze and understand how female surfers saw themselves and fought the often misogynistic representations of women in the magazine. This study is part of a History M.A. thesis in progress on representations of women in surf culture using issues of Surfer Magazine from the 1960s and 1970s. The 1960s and 70s were years of cultural and political change and turmoil in the United States. Surfing intersected with many of these issues, including civil rights, the antiwar movement, and counterculture. Gender relations proved no different. In an attempt to reconcile a rapidly changing ideas of women’s place in society with established stereotypes and behaviors, Surfer Magazine portrayed women in complex and contradictory ways.

121  10:00 am

Girls Are as Surfing Is: Representation and Negotiation of Women in Surf Magazines

Jasmine Tocki, History (M)
Eve Kornfeld, History

“The girls are as surfing is—not to be analyzed, but to be enjoyed,” wrote the associate editor of Surfer Magazine in 1966. This dismissive attitude exemplified male views towards surfing women in the United States in the 1960s and 1970s. These decades were a period of intense debate about the presence of women surfers within the culture. Through surf magazines, women participated in the subculture while facing discrimination from their male counterparts. This study argues that magazines like Surfer Magazine presented contradictory views of women’s participation in surf culture in 1960–70s Southern California. While casually printing images and stories of individual women who surfed, they also repeated and enforced damaging gender stereotypes about the proper behavior and appearance for women. Within this male-dominated medium, women expressed dissatisfaction with and contested their subordinate position through writing and interviews. Women surfers in the 1960s and 70s found themselves in a liminal space between begrudging acceptance and outright hostility and fought for a space for themselves built on mutual respect.

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122 10:15 am
**Deconstruction of the Cuento: Subversive Language in Three Short Stories by Luisa Valenzuela.**
Magdalena Padilla, Spanish (M)
Lauren Applegate, Spanish and Portuguese Language & Literature

Abstract: Luisa Valenzuela’s *Cuentos de Hades*, published in 1993, present a collection of short stories, inspired by Charles Perrault’s classic fairytales. Valenzuela rewrites these classic short stories to represent modern women in today’s society, thereby criticizing Perrault’s original versions. However Valenzuela gives an unexpected twist to the stories giving agency to the main characters in order to represent the oppression that has followed women for many years. In my literary analysis, I argue that *Cuentos de Hades* is a deconstruction of the classic fairytale in order to criticize the role that women play in their respective original stories. Valenzuela’s short stories such as “Si esto es la vida yo soy caperucita roja”, “4 principes 4” y “La densidad de las palabras” employ different literary devices, such as parody irony and satire, to deconstruct and rewrite the classic fairytale. Valenzuela’s characters use a specific kind of language to demonstrate their agency and how they break society’s perception of women. I propose that Valenzuela’s short stories are a critique of the classic Perrault fairytales, which have aided in the establishment of stereotypes about women in society.

Session A-5
**Oral Presentation:** Urban History and Communities
Friday, March 4, 2016, 9:00 am
**Location:** Metztli

123 9:00 am
**The Impact of World War II on Italian Americans**
Alyssa Moscrop, Political Science (U)
Clarissa Clo, European Studies

The following study, a segment of a more extensive digital project on Italian Migration and San Diego’s Little Italy developed using the media-rich scholarly platform Scalar, focuses on the impact of World War II on Italian Americans between the years of 1939 and 1945. A strong emphasis is placed on Italian Americans in California, particularly San Francisco and San Diego where the consequences of the war after Pearl Harbor had different implications than in other parts of the country. The presentation will argue that the Second World War had a tremendously negative impact on Italian Americans in the 1940s; their notion of security and sense of belonging in the United States was critically damaged during the war years as a result of forced migration into military zones, surrendering of “suspicious articles”, forced internment, and tremendously negative “enemy alien” stigma. Each portion of the project contains an excerpt of authentic Italian American stories, memories, and personal sentiments. This information was gathered from several primary and secondary sources including academic studies and online archives and databases (such as San Diego Union Tribune, video interviews and testimonials). The objective was to not only provide an account of a history largely unaccounted for, but also to personalize it so that Italian Americans can be given the respect and acknowledgement that they deserve for their sacrifices during the war. My research found that the severe degree of ethnic discrimination that Italian Americans faced during the war also ironically served to assimilate them into American society. Thus Italian Americans were ultimately “Americanized”, as a result of their sacrifices during WWII. This digital media project shows that the plight of Italian Americans has much to contribute to discussions of WWII and its effect on both mainstream America, and its ethnic and immigrant communities. Scalar provided a challenging, yet enriching opportunity to present this research in a multimedia and multi-sensory manner that allows for scholarship to be shared, remixed and circulated in an open source format.

124 9:15 am
**San Diego Boostering and Robert “Bob” Wilson**
Stephen Dichera, History (U)
Andrew Wiese, History

The purpose of this research was to gain a better understanding of the role that members of Congress can play in trying to improve their local economies. The research methodology was to first view what other historians had to say on the subject and then to delve into the archives of the SDSU library special collections. Once in the related collection, research was done on the basis of subject labeling, year, and quantity of material available. There was ample research material available on San Diego member of Congress, Bob Wilson. Bob Wilson served 14 consecutive terms in Congress, starting in 1953 and ending in 1981. The result was the discovery of material that indicated Bob Wilson spent a great deal of his time in Congress encouraging federal contracts and other federal spending in San Diego. From this discovery, it could be said that Wilson worked to ensure that funds would flow into San Diego with regularity in order to continuously stimulate the city’s economy.
125  9:30 am
“Busiest Man on Campus”: Lorenzo Madalena’s San Diego State Connections
Lillian Glenister, Journalism (U)
Clarissa Clò, European Studies
In Lorenzo Madalena’s novel Confetti for Gino (1959), the author gives a realistic look into the private Sicilian fishing community of San Diego’s Little Italy in the fifties. Although the book was out of print for many years and was quite controversial when it was first published due to some unflattering characterization, it remains the only literary account of the historical neighborhood formally known as the Italian colony. Madalena grew up in the Italian colony, and even though he knew the culture well from his experiences living with a fisherman father and being around Sicilian fishermen throughout his life, he still was never a true insider in his community. While his novel discusses the lives of Sicilian fishermen youth through the story of protagonist Gino DeMarino, where the majority of the young men did not receive any form of higher education or barely passed high school, Madalena himself was a very accomplished scholar as documented by San Diego State University archives. Dubbed “busiest man on campus” in the 1941 university yearbook, Madalena went beyond and beyond the call of the average college student during his time at San Diego State College, the place we all now know as San Diego State University. By looking further into Madalena’s time at San Diego State College, we can now see how the ideas and themes presented in Confetti for Gino may have originated in his many scholarly pursuits on our campus. Through studying texts and primary sources such as Del Sudoeste yearbook and literary magazines from the 1940s, which are available through the SDSU university archives, we were able not only to obtain a closer look into what it may have been like for Madalena while he was studying at San Diego State College, but most importantly how this experience may have influenced the writing of his local novel, Confetti for Gino.

126  9:45 am
“Guttural German”: Herbert Marcuse, the Media, and Student Radicalism in San Diego During the 1960s
Beau Bennett, History (M)
Eve Kornfeld, History
Many university campuses in the United States experienced increased levels of unrest during the 1960s. Universities in San Diego were no different and they contributed to facets of student rebellion regionally and nationally. Arguably, no one figure became such a polarizing and inspiring icon of radical thought in the 1960, other than UCSD’s Professor Herbert Marcuse. Guttural German seeks to uncover the roots of the Marcuse controversy during his time at UCSD while exploring the factors motivating his most vocal critics. This presentation designed for the SRS, is part of a deeper investigation in a forthcoming thesis of the same title. Guttural German utilizes secondary source material that contextualizes the detractors of Marcuse and traces their history of opposition towards contrarian thought in the region. Additionally, Guttural German relies heavily on primary sources from The San Diego Union, as well as archival material originating from SDSU Library’s Special Collections, letters and transcripts from (Dean of San Diego Journalism) Harold Keen’s collected papers; pamphlets, letters and documents from the Gwartney American Legion and Anti-Communism Collection. Guttural German also tries where appropriate, to channel Marcuse’s negative philosophy and dialectical thought by juxtaposing radical ideas from the left and the right. Contradictions presented in media reports involving SDSC’s invitation to National Socialist— George Lincoln Rockwell as compared to UCSD’s course taught by Black Panther — Eldridge Cleaver.

Much has been written regarding Marcuse’s time in San Diego and his reluctant role as father of the “New Left.” What makes Guttural German unique is its focus on the media’s function in the lead-up and eventual resolution of the Marcuse controversy. Guttural German’s unique contribution to the Marcuse’s controversy in San Diego is the discovery that the Copley press deliberately misrepresented or misunderstood Marcuse’s views in The San Diego Union. Additionally, veteran newswoman Harold Keen was crucial in providing a forum on television which allowed Marcuse to speak in his own words to San Diegans without the filter of the Copley press. Letters written to Keen help support this interpretation.

127  10:00 am
Craft Beer in San Diego: A Consumable’s Effect on a City’s Identity and Landscape
Lindsay Lehnhoff, History (M)
Eve Kornfeld, History
A craft beer craze is sweeping the nation; there is no doubt about it. With over 100 brew houses located in county limits, few cities are as affected by this trend as San Diego. But what does this mean to the city’s residents and the urban environment they live in? Has this consumable item changed San Diegan identity or the physical landscape of the city? A study on craft beer in San Diego may reveal more than just the roots and manifestations of a fad, but showcase shifts in the city’s cultural character, population configuration, and urban geography.
This project is a historical analysis, but also utilizes methods and theories from geography and sociology, particularly in relation to place, community, and identity. Primary sources are mostly derived from local media publications such as: the San Diego Reader, the Union-Tribune, and the West Coaster. These sources provide textual, geographical, and numerical data pertaining to...
Multiphysics to create a comprehensive 3D model of Al/SiO2. This research utilizes COMSOL to have concluded that Al/SiO2 exhibits similar exotic behavior past the diffraction limit of a standard LED. Previous studies at the same frequencies independent of cavity size; breaking these effects has shown that microdisks will contain WGMs to alter confinement. Hyperbolic dispersion works naturally with cylindrical cavities which produce Whispering Gallery Modes (WGM) to create a very high photonic density of states, leading to rapid and large spontaneous emission. The combination of this model serves as a platform for future research where the symmetry is broken with dipole placement; leading the potential use for Ultrafast LED's and Optical Bio-sensing.

Session A-6
Oral Presentation: Physics
Friday, March 4, 2016, 9:00 am
Location: Templo Mayor

128 9:00 am
Al/SiO2 Metamaterial Microdisks with Hyperbolic Dispersion
Grant Varnau, Physics (U)
Lyuba Kuznetsova, Physics

In the rapidly growing field of optical metamaterials, materials with hyperbolic dispersion show great promise. Hyperbolic dispersion is a unique phenomenon that creates extremely high k vector propagation and momentum mismatch, causing total internal reflection (TIR) at the interface of the material. This TIR works naturally with cylindrical cavities which produce Whispering Gallery Modes (WGM) to alter confinement. Hyperbolic dispersion also creates a very high photonic density of states, leading to rapid and large spontaneous emission. The combination of these effects has shown that microdisks will contain WGMs at the same frequencies independent of cavity size; breaking past the diffraction limit of a standard LED. Previous studies have concluded that Al/SiO2 exhibits similar exotic behavior on a 2D axisymmetric model[1]. This research utilizes COMSOL Multiphysics to create a comprehensive 3D model of Al/SiO2 microdisks to showcase their unique properties numerically. By comparing the numerical simulation to an ideal dielectric resonator model with the free magnetic wall approach, we are able to validate the legitimacy of our 3D COMSOL model. This model serves as a platform for future research where the symmetry is broken with dipole placement; leading the potential use for Ultrafast LED's and Optical Bio-sensing.

129 9:15 am
Improved Numerical Projection of Angular Momentum
Kevin O'Mara, Physics (U)
Calvin Johnson, Physics

Atomic nuclei are often used as laboratories to detect and measure exotic physics such as neutrinos, parity violation, and nonbaryonic dark matter. However, nuclei are complicated and difficult to accurately model even with advanced modern computers. One useful technique is the angular momentum-projected Hartree-Fock approximation. The Hartree-Fock approximation simplifies the many-body problem by averaging over all the particles, but it often mixes states of different angular momenta. Angular momentum projection separates out states of different angular momenta, leaving behind generalized matrix eigenvalue equations for each possible angular momentum which yield the excitation spectrum. Typically the projection is performed by a three-dimension integral using orthogonal functions. However, the integrand is computationally expensive and evaluating it at thousands of mesh points limits its applicability.

We have developed an alternative approach: we find a minimal set of linear relations which require approximately ten times fewer evaluations of this integrand. These linear relations may be solved through matrix inversion to obtain angular-momentum projected eigenvalue equations.

This project implements the new formalism and investigates its efficiency. As anticipated, we see speed-up of calculations by as much as an order of magnitude due to fewer evaluations. This work is potentially applicable to multiple approaches in many-body calculations.

130 9:30 am
Generation and detection of first order polar vector beams using a segmented Q plate with q=1/2
Sam Delaney, Physics (U)
Jeffrey Davis, Physics

Q-plates convert light into different two dimensional polar vector orders by inducing phase differences to rotate the polarization states of light as a function of the polar angle around the center of the beam. Using a polarization state generator consisting of
a quarter waveplate and a polarizer, we can effectively generate any point on the 0 order Poincaré sphere, which in turn can be converted into any point on the first order Poincaré sphere by a Q plate. We have demonstrated this by generating and detecting beams at every pole of the first order sphere using the polarization state generator and a 12-piece segmented Q plate. Images captured of each beam generated agreed with the predicted outcomes. Polar vector beams of varying orders have possible applications in communications technology, particle acceleration and analysis, and high precision narrowly focusing beams.

131 9:45 am

**Single Beam Gradient Force Optical Trapping Applied in Biological Systems**

James Heller, Physics (U)
Matt Anderson, Physics

Introduction: Here we discuss the theory of optical trapping, and go over photon momentum, and imparted force. We also review experimental goals, the calibration of the optical tweezers by finding the corner frequencies and trap stiffness. Methods: Full description of the Thorlabs Modular Optical Tweezers, and other associated equipment. Step-by-step methodology is given, and details about contamination prevention and safety measures are reviewed. Results: In this section, we look at observed corner frequencies, and calculate trap stiffness. Experimental images are displayed and the Lorentzian fit is attained from the power spectrum curve vs. bead oscillation frequency. Discussion: Finally, we talk about what the trap stiffness means, and how it can be useful when running optical trap experiments. Also we go into applications of optical trapping in other fields, engineering, medicine, and biology, and discuss the future experiment looking into the biological attributes of a pig mucin solution.

132 10:00 am

**Localizing 3D Positron Emission Tomography scintillation events**

Dennis Seely, Physics (M)
Robert Nelson, Physics

Conventional Two Dimensional (2D) positron emission tomography (PET) systems typically encompass a depth spatial resolution of approximately the length of a detector element (a scintillator rod) contained within the system. These 2D PET systems do not include any information regarding the gamma ray depth of interaction (DOI) within the scintillator rod. This degrades image reconstruction spatial resolution and thereby produces less accurate results in determining where a lesion resides within tissue. Improved 3D PET systems provide limited DOI by positioning photodetectors (a dual readout) at both ends of the relatively long scintillator rods. The scintillator rods are long in order to offer acceptable stopping power for the high energy gamma rays. The need for long scintillator rods has 3 drawbacks: reduced energy resolution, reduced DOI resolution and a reduced selection of acceptable scintillator materials. By designing a system that interlays scintillation rods of selectable length in a 3D crossed matrix, it is possible to determine where a gamma ray scintillation event occurred within the 3D matrix, thereby predicting where the event occurred. Dual readout electronics are not needed (ultimately reducing cost) since DOI is inherently determined by the detector geometry. Long scintillator rods are not needed permitting improved energy resolution and a greater selection of scintillator materials. Preliminary research has showed that there are differences in signal output (integrated number of detected counts) of this 3D crossed scintillation configuration v. single detector element configurations. The data presented provides preliminary results in total counts detected, energy resolution, and spatial resolution.

133 10:15 am

**Generation of selective states of polarization using a diffraction grating encoded onto a spatial light modulator**

Katherine Badham, Physics (M)
Jeffrey Davis, Physics

A transmissive liquid crystal spatial light modulator (LC-SLM) is used to encode specially made diffraction gratings with the ability to create a selective number of diffraction orders with separate states of polarization. The grating phase profiles are added to an external program which encodes the profiles onto each half of the SLM. The system is aligned in a reflective architecture allowing control over both vertical and horizontal components of the input laser beam. The superposition of the diffraction gratings creates the desired orders with different states of polarization. First, zero order polarization states of light including linear, diagonal and circular states are reviewed. Finally, an output diffraction pattern of orders with separate states of polarization is shown using the technique of polarimetry.
Solution binding studies of Drosophila melanogaster UNC-45 protein
Perla Pena Palomino, Chemistry/Biochemistry (U)
Tom Huxford, Chemistry & Biochemistry

The proper function of muscle depends upon the assembly of myosin heavy chains into thick filaments and organization of the sarcomere. Genetics studies carried out in organisms as diverse as worms, flies, and fish indicate that the protein product of the UNC-45 gene is necessary for proper folding, assembly, and function of skeletal muscle. Despite its clear phenotype, the mechanism by which the UNC-45 protein affects myosin assembly is not well understood. In support of future studies aimed and structural and in vitro biochemical characterization of UNC-45 function, we designed and prepared a bacterial expression plasmid that harbors the full length UNC-45 protein from the fruit fly Drosophila melanogaster fused to an amino-terminal glutathione-S-transferase (GST) protein, linked with a polypeptide sequence that bears the recognition site for the Tobacco Etch Virus (TEV) Protease. The protein expresses in E. coli bacteria as a 138 kDa single chain polypeptide and can be purified by glutathione-sepharose affinity chromatography and size exclusion chromatography with a yield of 5-10 milligrams per liter of culture. GST-pulldown experiments confirm that HT-Hsp83, a histidine-tagged version of the Drosophila homolog of Hsp90, precipitates specifically with GST-DmUNC-45 and suggest that the observed DmUNC-45:DmHsp83 complex interaction involves portions of the proteins outside the N-terminal tetratricopeptide repeat (TPR) domain of UNC-45 and the C-terminal MEEVD sequence of Hsp83. In support of the hypothesis that UNC-45 and Hsp83 interact at a specific protein:protein interface, purified HT-UNC-45, HT-Hsp-83, and a complex of the two were partially digested with chymotrypsin and observed by SDS PAGE. Novel bands appeared that were specific to the proteolyzed complex. We began to map this interaction via Hydrogen-deuterium Exchange-Mass Spectrometry (HDX-MS). We will measure the complex dissociation constant $K_D$ by MicroScale Thermophoresis (MST) for which we have engineered two fluorescent full length Drosophila UNC-45 bacterial expression plasmids, one with the A. victoria Green Fluorescent Protein (GFP) fused to an amino-terminal end and one with GFP fused to its carboxy-terminus. Attempts are being made to crystallize the HT-Hsp83 protein alone and the complex of HT-DmUNC-45 and HT-DmHsp83 in preparation for high resolution structure determination by x-ray crystallography.
136  9:30 am  
**Synthesis and Biochemical Evaluation of Axially Chiral Terephthalamide Derivatives as Selective α-Helix Mimic Inhibitors of Protein-Protein Interactions**

Arianna Ayonon, Chemistry (U)  
Jeffrey Gustafson, Chemistry & Biochemistry  

Atropisomers can exist as either rapidly interconverting racemic mixtures or stable isolable enantiomers depending on the degree of steric bulk adjacent to the chiral axis. We are studying the effects of atropisomeric conformation on the target selectivity of Terephthalamide based α-helix mimetics. To do this we rigidified a rapidly interconverting atropisomeric axis via introduction of halogens ortho to it using Lewis base catalysis. During these studies we found surprisingly high stereochemical stabilities compared to those found in literature for similarly substituted amide atropisomers. To understand the origin of this effect several ‘point mutant’ analogs have been synthesized and evaluated via H¹ NMR and Chiral HPLC for stereochemical stability. The insights gleaned from these studies will guide the design of future atropisomerically stable small molecules.

138  9:45 am  
**Selective Synthesis of Phosph(on)ate Esters using Diazoalkanes Generated In Situ**

Breanna Canter, Chemistry (U)  
Byron Purse, Chemistry and Biochemistry  

Phosphate and phosphonate moieties are of particular interest in medicinal chemistry because of the role of phosphorylation in the regulation of metabolism. Traditionally, kinases, which are enzymes that add phosphate groups, have been one of the most prevalent classes of enzyme targets in drug development. Phosphatases, which remove phosphate groups, have been much less viable drug targets, because their inhibitors typically need to include a phosph(on)ate group for efficacy, and these groups are challenging to include in prospective drug leads. The most common obstacle is the inability for molecules containing these charged phosph(on)ate groups to bypass cellular membranes. This project aims to increase the ability of such molecules to pass through cellular membranes by esterifying the attached phosphate groups. Through the use of diazoalkane intermediates formed in situ under mild conditions, we have developed new, practical methods for the selective esterification of phosphorus compounds. The diazoalkane intermediates are generated from the oxidation of protected hydrazones and made available to react with phosph(on)ate-containing species to yield phosph(on) ate esters with high chemoselectivity. Using methods including high pressure liquid chromatography and phosphorus nuclear magnetic resonance to characterize these reactions, our research demonstrates a simple procedure for synthesizing phosph(on) ate esters in good yields. The esterification of phosph(on) ate groups has significant applications for the permeability of drug molecules and for further investigations into prodrug development in medicinal chemistry.

139  10:00 am  
**Probing the Molecular Mechanism of IDH1 Tumorigenic Mutations**

Diego Avellaneda Matteo, Chemistry (M)  
Christal Sohl, Chemistry  

Currently, an estimated 700,000 Americans are living with brain tumors. Glioblastoma has 5-year relative survival rate ranging from 4-17% based on age of diagnosis. Isocitrate dehydrogenase I (IDH1) mutations have been linked to 70% of grade II-III gliomas and 88% of cases of secondary glioblastoma multiforme (GBM). IDH1 catalyzes the NADP⁺ dependent oxidative decarboxylation of isocitrate to α-ketoglutarate (αKG) in peroxisomes and cytosol. The most common mutation is at position 132 where an arginine residue is replaced by histidine. Due to these mutations, mutated IDH1 gains the ability to transform αKG into 2-hydroxyglutarate (2HG) using NADPH as cofactor. 2HG is a proposed oncometabolite that is capable of inhibiting certain enzymes that are required for gene regulation. Moreover, the low levels of NADPH can potentially cause oxidative damage that could also support tumorigenesis. With the use of steady-state kinetics, we have determined the relative ability of three proposed tumorigenic IDH1 mutations to convert αKG to 2HG. Additionally, pre-steady state kinetics will allow us to propose an accurate catalytic cycle in which mutated IDH1 converts αKG into 2HG. By determining the molecular mechanism of dysfunction of IDH1 mutations, we can provide a platform for development of better therapeutic inhibitors for anticancer treatments.
Quantifying the Effects of Santa Ana Winds on Wildfires
Logan Kiff, Mechanical Engineering (M)
Fletcher Miller, Mechanical Engineering

Wildfires have caused devastating damage to wildlife, structures, and human lives. Here in southern California, catastrophic wildfires are greatly influenced by the Santa Ana winds. Research is being funded by the National Institute of Standards and Technology (NIST) to study the wind patterns in Rancho Bernardo. Wind speeds, directions, pressure, temperature, and humidity in the Rancho Bernardo Community are being monitored to research the effects of Santa Ana Winds on wildfires. Locations of the instruments are based on the path of the wildfire, influenced by the Santa Ana Winds, which devastated the community in 2007.

Experimental data in the community is being collected through the use of various cup anemometers, wind vanes, a pressure transducer, and a Relative Humidity/Temperature sensor. A Sonic Detecting and Ranging Unit (SoDAR) is setup at the boundary of the community to measure incoming and exiting winds by emitting beep-like sounds so wind speeds can be measured at different altitudes. The experimental data collected by the SoDAR is used as the boundary conditions for simulations ran using NIST’s Wildland-Urban interface Fire Dynamics Simulator (WFDS). The experimental and simulated data in the Rancho Bernardo Community is then compared to determine the effectiveness of WFDS in addition to the effectiveness of the SoDAR measuring boundary conditions. Fourteen sites have been monitored for seventeen months. Over the seventeen months, we have seen daily winds of West to East, numerous Santa Ana events of wind blowing East to West, and some days with no wind. To be able to easily track Santa Ana events, a Matlab script is being implemented by removing low wind speed, and all winds blowing from West to East. The Matlab script then plots the filtered data as a wind rose to visualize both the wind speed and direction on the same plot.
Visitor Activities and Awareness of Marine Protected Areas and Species Composition at Rocky Intertidal Sites in San Diego, CA
Monica Tydlaska, Biology (M)
Matt Edwards, Biology

Human actions are changing both terrestrial and aquatic ecosystems, and ultimately causing increased rates of species extinctions. Furthermore, a majority of species’ population sizes and/or geographic ranges are declining worldwide due to anthropogenic stressors. Many of the stressors that impact rocky intertidal ecosystems result from increasing urbanization, recreational activities, and harvest of species at the shore. San Diego’s temperate coastal climate, in particular, attracts large numbers of visitors who conduct recreational activities and harvest species at the ocean water’s edge including the rocky intertidal zone. As a result, following years of planning, several marine areas around San Diego have been protected from harvest as part of a network of Marine Protected Areas (MPAs). This study investigates (1) visitor knowledge about Marine Protected Areas (MPAs) in San Diego County, (2) visitor activities and (3) species composition in three MPA intertidal locations and three nearby non-MPA intertidal locations. Visitor intensity varied between 8–70 visitors per 10-minute period. Tide pooling was the most frequent activity with 83% of visitors engaging in this activity. Visitors were observed collecting at both the MPA and the non-MPA study sites. Collection intensity varied between 0.01 collectors per 10-minute period and 0.98 collectors per 10-minute period. Although collection of any type is prohibited in MPAs, visitors were nevertheless seen taking abalone, crabs and snails from study sites inside MPAs. This thesis confirmed the Ambrose et al. (2005) findings, that enforcement of regulations at southern California rocky intertidal sites is virtually absent and that enforcement would be most effective on weekends and at sites that are most highly visited. Species composition analysis results showed no significant difference between paired study sites. Surveys of rocky intertidal visitors suggest that the main problems facing rocky intertidal MPAs in San Diego County are (1) lack of effective enforcement, (2) inadequate signage, and (3) lack of visitor knowledge about MPA no-take regulations. Improvements in management strategies are recommended such as additional efforts to educate visitors before and during visitation, expanded docent programs, and increased enforcement of regulations. Better management techniques are needed to reduce human impacts on all rocky intertidal ecosystems.

Predicting streamflow variables for the US using regional regression models
Geoffrey Fouad, Geography (D)
Allen Hope, Geography

Streamflow variables describing the magnitude and frequency of flows are important for flood planning, water use, and a host of other water resource applications. Such information is often needed for sites without gauged flow data, and this is referred to as the prediction in ungauged basins problem in hydrology. Predictions in ungauged basins are accomplished using information from gauged basins to predict streamflow variables for ungauged basins. A common approach uses regression models consisting of physical and climatic basin characteristics associated with the streamflow variable. The hypothesis of this study was that regression models would benefit from using basins with similar physical and climatic characteristics since they may have similar streamflow regimes. Regression models were developed for 918 basins in the US to predict percentile flows identifying the flow magnitude equaled or exceeded for a given percent of time. Percentile flows were used to test the hypothesis from low to high flows. The basins were divided into regions according to a cluster analysis of their physical and climatic characteristics, and resulting regions were used to develop separate regional regression models. Predictive performance was assessed using 184 validation basins excluded from regression model development, and results were compared to a global regression consisting of all the basins. The study provided evidence for the hypothesis that the use of similar basins improves streamflow predictions as the regional regression models performed far better than the global regression. The regional regression models consistently explained two thirds of the variance in the percentile flows, whereas only half of the variance was explained using the global regression. Regional conditions were related to differences in percentile flows, and this accounts for the improved predictions of the regional regression models. These results emphasize the importance of using similar basins for predictions in ungauged basins, and different approaches for identifying similar basins should be tested in future studies.
Student Level: (U)=Undergraduate; (M)=Masters; (D)=Doctoral

144 10:00 am
Terrigenous Sediment Dynamics in a Small, Tropical Fringing-Reef Embayment, American Samoa
Alex Messina, Geography (D)
Trent Biggs, Geography

Watershed disturbance can increase sediment stress on corals, but clearly linking sediment sources to reduced coral health poses significant challenges for environmental managers. This study provides a template for managers in remote, sediment-impacted environments, who wish to quantify relationships between watershed sediment sources, water circulation over the reef, and the spatial distribution of sediment accumulation on the reef. In-stream sediment yields were monitored downstream of undisturbed forest, a quarry, and village, before and after sediment mitigation in the watershed. An event-wise sediment budget showed the disturbed quarry and village contributed about 70% of sediment loading to the embayment. Following sediment mitigation at the quarry, sediment loading to the embayment was significantly reduced. An empirical model of water circulation and residence time over the reef was developed from GPS drifters (5 drifters, 30 deployments) and acoustic current meters. Shortest residence times were on the exposed South Reef near breaking waves, and longest over the reef flat close to shore and sheltered northwest corner of the embayment. This circulation pattern explained the significantly higher accumulation of terrigenous sediment on the North Reef, than on the South Reef, as measured by tubes and SedPods. The sediment plume discharged during storms was deflected over the North Reef, leading to increased sediment accumulation on corals and reduced coral health. Conversely the South Reef remains relatively healthy due to the observed circulation pattern that prevents fine, terrigenous sediment from being transported over the South Reef.

145 10:15 am
Assessing postfire recovery of chamise chaparral based on multitemporal Landsat SVI trajectories
Emanuel Storey, Geography (D)
Douglas Stow, Geography

Methods include: 1) determination of postfire shrub fractional cover changes based on multi-date high spatial resolution orthoimagery, 2) stratification of sites by recovery outcomes based on levels of postfire shrub decline, 3) ANOVA testing to assess how sensitive are Landsat-based regrowth trajectories to postfire shrub decline, comparing several spectral vegetation indices (SVIs) and metrics applied to the recovery trends, and 4) assessment of regrowth trajectories 19–29 years postfire, relative to field-based regrowth data from literature.

A primary finding is that several normalized metrics - the Regeneration Index and one proposed here, the Scaled Recovery Metric—help to indicate postfire recovery states based on time-sequential SVI trajectories and to facilitate inter-site comparisons. Several SVIs (NDVI, NDMI, NBR, and NBR2) provide statistical indications of postfire recovery outcomes when the above normalized metrics are applied; the same SVIs are sensitive to long-term postfire dynamics of chamise. This study provides an overview of some advantages, limitations, and technical considerations for using SVI trajectories derived from Landsat imagery to assess long-term impacts of fire on chamise chaparral.

Session B: Oral Presentations

Session B-1

Oral Presentation: Ethnicities & Identities
Friday, March 4, 2016, 11:00 am
Location: Pride Suite

146 11:00 am
Border Stories: Are Immigration Attitudes Shaped by Fear?
Kellilah Federman, Political Science (U)
Kristin Maher, Political Science

Located on the highly politicized US-Mexican border, San Diego’s population offer a unique lens into immigration attitudes in the region. This project investigates how immigration attitudes seem to be shaped by residents’ demographic contexts and the stories that circulate in San Diego about the neighboring city of Tijuana. Between 2006 and 2008 San Diego State University’s Dr. Kristin Maher and her team of research assistants recorded 45 in depth interviews about Tijuana and immigration. Six diverse communities in San Diego were represented in the data set and responses were coded in the program HyperResearch. As Dr. Maher’s research assistant, I evaluated attitudes towards immigration based on demographic context in terms
of community affiliation, political orientation and educational background. Studies of immigration attitudes often explain the patterns in terms of these demographics. This paper goes one step further, examining how attitudes about immigration might also be shaped by local belief structures, and particularly generalized fear of Tijuana. Focusing on the subset of respondents who offered negative stories about Tijuana this paper finds a correlation of fear with various demographic factors. This analysis operationalizes fear towards Tijuana and its population by studying the horror stories propagated about Tijuana among San Diegan respondents in the study, including violent urban legends and remote third hand stories of occurrences in Tijuana. By analyzing the correlations between narratives of horror and respondents’ immigration attitudes, this study explores a new way of understanding immigration politics in the borderlands.

147 11:15 am

From Shackles to Jumpsuits: A Racial Critique of ‘Orange is the New Black’

Samantha Davies, Health Communication (U)
Charles Goehring, Communication

This paper is a rhetorical criticism of the Netflix original series, Orange is the New Black. Many critics have analyzed OITNB as a text that perpetuates racist ideology. For instance, many of the minority inmates are portrayed as uneducated, destructive criminals that are serving time for hard crimes. On the contrary, the white inmates are portrayed as affluent, educated citizens that are serving time for white collar crimes. This contrasting characterization between the white and black inmates has led critics to interpret OITNB as a text that not only encourages prejudice perceptions of minorities, but also promotes white hegemony. Therefore, it has been argued that OITNB reinforces white superiority. Through the rhetorical methods of close textual analysis and narrative analysis, I instead argue that OITNB overturns stereotypical conceptions of minorities by criticizing capitalism as the foundation of racist notions. Thus, utilizing critical race theory and a Marxist ideological framework, I suggest that OITNB’s storylines, especially the telling of minority narratives, are designed to critique capitalistic ideology as the root of racial injustice and disempowerment.

148 11:30 am

Being Latina: Perception vs. Reality

Rosa Valencia, Philosophy (U)
J. Angelo Corlett, Philosophy

With a vast numbers of Latinos incarcerated, living in poverty and being supported by the government, it is hard to look past what may seem to be bad, and focus on the strengths we have. To be a Latina in this world, for me, unfortunately is to be looked at as ignorant for having broken English, even though I am fluent in two languages. To be a Latina is to be labeled as bad tempered or dangerous, even though I am a full time student, have a full time job and have no criminal record. To be a Latina is wake up and see my family through a fence that determines our capability of chasing the American dream, a fence that separates the “lucky” ones that were able to immigrate to the U.S., one that restricts who can step on certain soil, and forces families to have breakfast in company of border patrols. To be a Latina is to see those same people that are told they cannot become citizens cross the border every morning to work on our agriculture. In other words, to be a Latina is to be strong, focused and eager for all opportunities to improve our future. To be a Latina is to recognize the strength of our parents and grandparents and take advantage of what they have done to bring these opportunities. It is to keep and practice a vibrant culture that helped build a nation though in that same nation, that culture is ostracized and belittled by the mainstream entertainment and presidential candidates. I am a Latina, but not your definition of a Latina.

149 11:45 am

The Subtle Genocide of the Indigenous People

Vicky Madera, International Security & Conflict Resolution (U)
Cheryl O’Brien, Political Science

The militarized government of Mexico has committed malicious violence against the female indigenous population which has created an intra-state conflict between the indigenous population and government. I argue that the human rights abuses against pregnant indigenous women exemplifies a breakdown in the relationship between state institutions and the female citizen population. Although Mexico has been under investigation surrounding the regulatory laws on the medical care of pregnant indigenous women specifically in the cities of Chiapas, Oaxaca, and Morelos, no real justice or peace has been created in this civil conflict.

150 12:00 pm

Restorative Justice and Care Ethics: A Coalition for the Transformation of the Legal System

Alicia Montellanos, Philosophy (M)
Marie Draz, Philosophy

The recent popularity of documentaries like The Jinx and Making a Murderer is making evident that there is something seriously wrong with the way our criminal justice system works. The present legal system relies on a retributive justice philosophy, understanding crime to be a violation of laws against the government that ought to be addressed with some form of punishment, e.g., incarceration. There is much that is wrong with the prison system and, as a result, restorative justice has been introduced in the last few decades as an alternative to the legal
system’s retributivist practices. Restorative justice redefines crime as harm, taking in consideration its impact on the community. As a means to hold offenders accountable it promotes the participation of offenders with victims of crime and the community to determine restitution. Proponents of this philosophy argue restorative justice should replace the retributivist practices of the legal system, eventually eliminating the use for prisons.

However, there are certainly problems with restorative justice theory as well, as it strongly maintains all participation in restorative justice programs should be voluntary. So, what happens when offenders are not willing to participate? It is established that by default retributive practices be used with offenders who are unwilling to cooperate. Restorative and retributivist practices are evidently not incompatible within the same legal system. But resorting to retributivist practices weakens restorative justice theorists’ claim that replacing the legal system with a restorative justice philosophy is a realistic goal.

I will argue that using retributivist practices can be justified in restorative justice theory if care ethics is adopted as a theoretical foundation and ethical framework. Care ethics provides a new logical basis—one that is largely different from a retributivist perspective and in agreement with restorative principles—to justify the use of retributive practices when individuals are unwilling to cooperate with restorative ones. Moreover, if care ethics adopts restorative justice as its view of justice, this would resolve the tension between care and justice as values within care ethics theory. Both theories can complement each other to establish how realistic their practical application is in society.

Reclaiming Indigenous Identity: Coping with Stigmatization and Discrimination in School

Ana Gabriela Kovats, Education (D)
Felisha Herrera Villarreal,

The acculturation and socialization of Latino immigrant youth in US schools has been well documented over the last three decades, particularly for Mexican and Chicano students (Olsen, 1997; Valenzuela, 1998; Portes and Rumbaut, 2001; Suarez-Orozco, Suarez-Orozco, and Todorova, 2010). However, within the context of Mexican immigrant youth or even pan-ethnic Latino students, indigenous immigrants are often overlooked in the examination of ethnic identity and academic performance. Many indigenous students are affected by the American educational system in different ways. Their process of ethnic identification also occurs against the backdrop of already existing Mexican and Latino ethnic identities rooted in colonial histories. For this reason, this study focuses on how perceptions of stigmatization and discrimination impact the ethnic identity development and academic trajectory of indigenous Mexican Mixteco immigrant students growing up in San Diego, California.

The research consisted of 20 semi-structured interviews with Mixteco youth, young adults, and parents as well as one year of participant observation at a community center in San Diego. This presentation will address two critical findings: 1) the participants’ interactions with non-indigenous Mexican students in school negatively impacted their ethnic identity development and 2) access to institutional agents on college campuses served as catalysts for the participants’ reclaiming of their indigenous identity as well as college success and community activism. This study aims at expanding current research on indigenous immigrant students while highlighting the importance of positive ethnic identity as an element for college success. Understanding the experiences of indigenous students will broaden our perspective about Latino students in US schools.

Session B-2
Oral Presentation: Health & Wellness
Friday, March 4, 2016, 11:00 am
Location: Park Boulevard

152 11:00 am
Differences in spatial memory among young, middle-aged, and older adults may depend on the level of interference: Evidence for less efficient pattern separation in older adults
Shannon DeJesus, Psychology (U)
Paul Gilbert, Psychology

Age-related spatial memory deficits may serve as an early indicator of mild cognitive impairment or Alzheimer’s disease. Pattern separation is a neural mechanism that may reduce interference among memory representations. Recent evidence indicates that less efficient pattern separation may be a key deficit in older adults that could contribute to age-related spatial memory impairment. We used signal detection theory (SDT) to assess spatial recognition memory utilizing a new behavioral test hypothesized to tax pattern separation. As part of an ongoing study, healthy young (n=40), middle-aged (n=8), and older (n=30) adults completed a spatial recognition memory test involving trials with high or low levels of spatial interference. On each trial, participants remembered the location of a circle that appeared on a computer screen. Then, a circle appeared either in the same location or a different location that was separated from the original location by 0.5, 1.0, 1.5, or 2.0 cm. Participants indicated whether the circle was in the “same” or a “different” location. Smaller spatial separations (0.5 and 1.0 cm) on “different” trials were hypothesized to result in greater interference than larger separations (1.5 and 2.0 cm), and hence
place greater demands on pattern separation. A 2 x 2 mixed model analysis of variance test and subsequent post hoc tests revealed that young and middle-aged adults, but not older adults, performed significantly better on low interference trials compared to high interference trials (p < .05). Young and middle-aged adults were found to significantly outperform older adults on both high and low interference trials (p < .05). No significant differences were found between young and middle-aged adults on high interference trials; however, middle-aged adults outperformed young adults on low interference trials (p < .05), which should be interpreted with caution given the small sample of middle-aged adults. Data collection is ongoing to increase the number of middle-aged adults included in the study. The present data indicate that spatial pattern separation may become less efficient in older adults, which could contribute to age-related spatial memory decline. However, our preliminary findings indicate that these changes may not occur until after middle age.

153 11:15 am

Can Non-Hazardous Landfills Be Bad for Your Health? An Examination of Their Effects on Neighboring Communities

Lillian Hernandez, Environmental Science (U)
Vinod Sasidharan, Sustainable Tourism Management

Hazardous landfills around the world have been found to affect human health due to their waste treatment processes producing odors and biological emissions to the environment. Past studies have shown landfills on the EPA’s superfund list to be hazardous for the health of residents surrounding the landfill due to materials seeping into the air and water. Landfill odors are a big risk to human health due to its non-methanic volatile organic compounds, hazardous air pollutants, the odorants released during landfill operations, and uncontrolled emissions. These odors are affecting the health of residents in multiple landfill sites that have been observed on the EPA’s superfund list. This research examined whether landfills, not considered to be hazardous, can have an effect on human health with regards to proximity and recorded levels of odor annoyance. The data was collected through the employment of a 25-question survey which was administered among residents, ages 18 to 64, living within 3 km of a landfill. Participants were randomly chosen from homes and shopping centers within the 3 km radius and were asked to self-report symptoms relating to respiratory problems, tiredness, irritations, and more common symptoms such as headaches, dry throat, and toothaches. Participants were also asked questions concerning demographics, satisfaction, odor annoyance, and their tap water. Findings suggest residents within 3 km have an annoyance with the odors coming from the landfill. Residents reporting high annoyance tend to have a higher concentration of respiratory symptoms such as dry throat/hoarseness, eye irritation, nose irritation, and cough. The findings imply a relationship between the odors that the landfills emit and the effect on the health of the surrounding residents. Based on the findings of this study, it is hoped that better techniques such as calculating the necessary thickness of the landfill liner or the distance of the affected residents be taken into consideration when planning the location of a new landfill.

154 11:30 am

An Evaluation of Wellness Program Participation at the La Jolla Institute

Emily Seymour, Public Health (M)
Tracy Finlayson, Graduate School of Public Health

Background: The workplace is an opportune intervention target for improving the healthy behaviors of a “captive audience” of employees through employer-sponsored wellness programs. The La Jolla Institute (LJI) is a non-profit immunology research organization located in La Jolla, California, on the University of California’s Science Research Park campus. In May 2015, there were a total of 365 employees at LJI. LJI’s Human Resources (HR) team offers a wellness program, LiveWell, to its employees. The success of LiveWell is measured by participation from employees. In 2015, the highest documented participation was 26%. HR would like to see at least 50% participation in LiveWell and is challenged with how to achieve this goal. This study evaluates LJI’s wellness program. Methods: A comprehensive literature review was conducted and multiple data sources unique to LJI (including an Employee Wellness Survey developed specifically for this report) were analyzed to evaluate the current status of LiveWell participation and develop appropriate recommendations to increase and maintain high participation in LiveWell. Data were analyzed using descriptive statistics and crosstabulations to identify sociodemographic and other factors associated with participation in LiveWell. Results: Overall, LiveWell participation tended to be higher among female employees. Being in an administrative role was positively associated with participation in certain types of activities (like the Wellnessland challenge, but not in the Spring into Motion challenge or the Employee Wellness Survey). Employees that were 40 years of age or younger appeared to be more likely to participate in all activities: Wellnessland, Spring into Motion, and the Employee Wellness Survey. Job flexibility, an employee’s comfort level with taking time during the work day to participate in LiveWell activities, and a lack of support from direct
supervisors regarding participation in LiveWell were threats to participation in LiveWell. Based on the HERO scorecard, LiveWell’s strengths included strategic planning, organizational and cultural support, and participation strategies. The scorecard indicated that the main weakness of LiveWell was measurement and evaluation. Conclusions: Eight recommendations were made to support the health and well-being of LJI’s employees, reduce health care costs, increase employee productivity, and support the retention and recruitment of high impact scientists.

155  11:45 am  
Factors Associated with Poor Provider-Patient Communication among Medicare Beneficiaries with a Usual Source of Care
Jenan Madbak, Social Work/Public Health (M)  
Melody Schiaffino, Graduate School of Public Health

Evidence demonstrates provider-patient communication is associated with a variety of important quality of care outcomes including patient satisfaction, global ratings, patient-centered care, patient activation, patient compliance, and health outcomes. The purpose of the current study was to identify structural characteristics associated with reporting poor provider-patient communication. This study used an adaptation of Donabedian’s structure-process-outcome (SPO) model as a guiding theory. For this study, poor communication was the process outcome of interest, while organizational factors and patient personal factors were used as structural factors.

The current study utilized data from the California Health Information Survey of 2011–2012, a continuous, population-based random-dial telephone survey, which asks health related questions to individuals over 12 years of age. The current study focused on CHIS adult data for adult Medicare beneficiaries with a usual source of care and a personal physician. The final sample for analysis is n=3,565. The current study is an analysis of secondary cross-sectional survey data. Statistical analyses included descriptive frequencies, sensitivity analysis, and bivariate and multivariable logistic regressions.

12.4% of the sample reported poor provider-patient communication, slightly higher than the national average. Medicare beneficiaries with Limited English Proficiency had higher risk of reporting poor communication than those with English Proficiency (AOR: 1.321, p-value< .007). Medicare beneficiaries below 300% of the Federal Poverty Line (FPL) had higher odds of reporting poor communication than those above 300% FPL (AOR: 1.36, p-value=. < .001). African-American Medicare beneficiaries had higher odds of reporting poor communication when compared to White beneficiaries. Female Medicare beneficiaries had higher odds of reporting poor communication when compared to male beneficiaries (AOR: 1.387, p-value < .007).

In conclusion having insurance, a usual source of care and personal physician does not eliminate the socio-demographic and cultural disparities in the reporting of poor-communication. There must be a continued focus on improving the processes of care at a systemic level, particularly for those individuals at high risk of poor communication.

157  12:00 pm  
Expiratory Flow Limitation, Dynamic Hyperinflation, and Locomotor Power and Fatigue
Jonathan Cunha, Exercise Physiology and Nutritional Sciences  
Daniel Cannon, Exercise and Nutritional Sciences

Expiratory flow limitation (e.g. asthma, chronic obstructive pulmonary disease) results in dyspnea, dynamic hyperinflation leading to low inspiratory reserve volume, and premature exercise intolerance. Associated arterial desaturation or blunting of locomotor O₂ delivery may exacerbate muscle fatigue. Unknown is whether expiratory flow limitation reduces locomotor power via limiting maximal evocable motor activity, exacerbating muscle fatigue, or both. We hypothesized: 1) Imposed expiratory resistance reduces locomotor power and exercise tolerance. 2) Expiratory resistance reduces maximal evocable motor activity. 3) Reduced evocable motor activity is most closely related to dynamic hyperinflation and dyspnea. To investigate, healthy volunteers (N=14, 23±3 yr, 170±8 cm, 68.7±12.5 kg) performed a series of cycling exercise tests with and without an imposed expiratory flow resistance (7 cm H₂O·L·s⁻¹). Simultaneous measurement of crank power and electromyography (EMG) of the leg muscles allowed the total decline in maximal isokinetic power to be apportioned to 1) the power equivalent from a reduction in maximum voluntary muscle activation (activation fatigue) and 2) the reduction in expected power at a given muscle activity (muscle fatigue). Additionally, we measured the difference between the required constant power task and the instantaneous maximal isokinetic power at intolerance (termed the ‘locomotor power reserve’). Expiratory flow limitation reduced exercise tolerance (487±145 vs. 575±137 s; p<0.001; Cl diff -125, -52 s), resulted in a greater decline in inspiratory reserve volume (0.19±0.56 vs. 0.76±0.54 L; p<0.01; Cl diff -0.94, -0.20 L), and increased dyspnea (8.5±2 vs. 6.7±2.5; p<0.01; Cl diff 0.7, 3.0). Muscle fatigue was unaffected at intolerance (19±34 vs. 17±34 W; p>0.05, Cl diff -20, 17 W). Conversely, activation fatigue was greater at intolerance with expiratory resistance (102±76 vs. 127±71 W; p<0.05; Cl diff 1, 49 W), and was related to the reduction in inspiratory reserve volume (r=-0.64, p<0.05). As a result, locomotor power reserve was smaller at intolerance with expiratory resistance (253±83 vs. 201±92 W; p<0.05; Cl diff -113, 10 W). Dynamic hyperinflation and low inspiratory reserve...
volume exacerbated activation fatigue and reduced locomotor power reserve. Thus, imposed expiratory flow limitation initiates a cascade of abnormal lung mechanics and symptoms, which conflate to reduce exercise tolerance through limiting evocable motor activity.

Session B-3
Oral Presentation: Environment & Public Health
Friday, March 4, 2016, 11:00 am
Location: Tehuanco

158 11:00 am
Food Security and Gender Analysis: Tanzania, Ghana, and Ethiopia
Kayla Magana, Communication (U)
Cheryl O'Brien, Political Science

Through the lenses of gender, peace, and social capital, I will examine the importance of women’s roles in food security, including case studies in Ghana, Tanzania, and Ethiopia. I argue that gender analysis of household food security is important for a post-conflict state’s development toward a strong and peaceful society, ultimately suggesting changes in policy to make progress towards eliminating food insecurity in these nations.

159 11:15 am
Genetic Disposition in PTC Taste Status and Beer Bitterness and Pleasantness Perceptions
Tawny Whaley, Psychology (U)
Clare Murphy, Psychology

Genetic taste preferences can affect the drinking habits of individuals. Genetic tasting of PTC has also been shown to influence rates at which people may consume alcohol. Although there has been significant research into PTC/PROP tasting status and food and beverage preferences, insufficient research has gone into investigating preference for various alcohol types, specifically, beers. This study is investigating how PTC taste status affects beer bitterness and pleasantness ratings. Participants 21 years of age or older, were recruited in various areas of San Diego. Participants showed their legal identification cards and filled out the consent forms, then experimenters confirmed their age and identification on the consent forms. The participants were asked to taste a piece of PTC paper and report the taste based on the gLMS of intensity. Participants then used the "sip and spit" method to taste the four beer types that were of various IBU ratings. The International Bitterness Unit (IBU) is the scale that is used to determine the general bitterness of beer. Participants rated the beers on: bitterness, intensity, and pleasantness. We investigated whether there was a significant difference among those who could strongly, mildly, or not at all taste the PTC paper, in regards to their bitterness and pleasantness ratings of beers of various flavor types. The results of this study are still being analyzed. Implications of this research are that there may be a deeper understanding of an individual's beer preference, which could lead to a greater understanding of beer consumption patterns. Understanding the different taste profiles in beer types, as well as how PTC taster status affects taste perceptions in beers could be powerful tools for assessing influences on consumption.

160 11:30 am
Calcium Supplement Intake and Bone Health in the Elderly: Awareness and Perception of Risk in the San Diego Geriatric Population
Joy Gao, Nursing (U)
Young-Shin Lee, Nursing

Background: Falls and fractures contribute to major health complications in aging adults. Poor bone health (osteoporosis and fractures) in the elderly can result in death, debility, and costly long-term care. There have been numerous research studies conducted to identify the risk factors of poor bone health, but little research about how the elderly population know their own bone health status. Objectives: Our study aimed to evaluate individual elderly awareness of osteoporosis and brittle bones, (2) to evaluate their perception of risks in developing osteoporosis, and (3) identify factors associated with 10 year fracture risks. Methods: This was a cross sectional design with a convenience sample of senior citizens (N=173) living independently in our San Diego community. Interviews were conducted with a survey questionnaire and 10 year fracture risk calculations by SDSU nursing students. Cross-tab, ANOVA, and multiple regression analysis were applied. Results: Among the total participants, 36.4% reported that they had a high risk of developing osteoporosis. There was no significant difference in behaviors between high risk and low risk perception groups. Between high perceived risk and low perceived risk group, there is no significance in walking as an exercise and calcium supplement intake. Those who have been informed about the risks of osteoporosis perceived themselves to be at high risk for developing osteoporosis. Significant factors contributing to 10-year fracture risks were old age, female, White and Asian groups, arthritis, history of broken bones after age 45, and parents who had hip fractures. Conclusions: There was a poor association of elder adult perception of their poor bone health and their subsequent behavior to prevent future bone fractures. This indicates that health care providers need to emphasize bone health status to the target population as well as behavior modifications.

STUDENT RESEARCH SYMPOSIUM 2016
161  11:45 am

**Awareness of Lead Poisoning Among Recent East African Immigrants: A Case Study of San Diego’s City Heights Community**

Rodgers Bwayo, Health Science (U)
Vinod Vinod Sasidharan, Hospitality and Tourism Management

Despite the gradual progress in reducing childhood lead poisoning in the US, the risk among East African refugee children remains a huge public health problem. Studies have found that refugee children from developing countries have twice as high Blood Lead Levels (BLLs) than others resettling in the US (Geltman, Brown, & Cochran; 2001). High prevalence of BLLs among refugees is attributed to older, and deteriorated paint housing that most refugees rent due to financial hardship (Caron, Tshabangu-Soko, & Finefrock; 2013). However, there is lack of data regarding the awareness of lead poisoning among East African refugees in the US. The objective of this study is to examine levels of awareness among new East African refugees in comparison to those who are either naturalized or born in the US. It is hypothesized that East African refugees are less likely to be aware of the risks posed by lead toxicity than US born immigrants. It is also proposed that risk of childhood lead poisoning is likely to be higher among refugees who do not speak English than those who speak English. In order to test these hypothesis, a survey containing 22 questions ranging from health literacy to home hygiene was administered among recent East African immigrants residing in City Heights. Participants were adults aged 18 and above, and were requested to participate based on their residency status and country of origin. The community of City Heights was chosen for this study due to its high rates of lead poisoning and large proportion of East African refugee residents. The findings of this study reflect conclusions from previous research, in terms of healthy literacy, education level and daily barriers that refugees face upon resettlement, in relation to their awareness of lead poisoning issues. East African refugees are likely to be unaware of the adverse dangers that lead can pose on children’s health. Integrated policy and programmatic efforts toward improving housing quality is essential for reducing risk of lead poisoning. However, effective refugee health surveillance and education of both refugee resettlement agencies and the people they serve is needed in City Heights.

162  12:00 pm

**Bangladesh and India: the escalating political and environmental crisis in the region of Bengal**

Fernando Gutierrez Ladron de, Exchange student, Business Administration /Theatre Arts.) (U)
Cheryl O’Brien, Political Sciences

The region of Bengal, in South Asia, is affected every year by flooding caused by excessive rains, monsoons and other devastating meteorological conditions. This region is split between two countries: West Bengal is part of India while East Bengal constitutes the country of Bangladesh, surrounded by India. However, Bangladeshi migrants are not welcome in India, as a dispute between both nations because of border regions has taken the relations between both countries to a critical point. This case study used official data from various offices of the United Nations, national governments and regional institutions, as well as on the field research made by non-governmental organisations and peer-reviewed journals, to assess the impact of the crisis in different groups of Bangladeshi population. This crisis was also compared to other cases in an effort to ascertain the future of the region.

From all the data obtained, the evidence showed that the conditions of the population of East Bengal (Bangladesh) in the flooding season are severely worsened because its border with India is closed, and no aid is received from its neighbour. West Bengal is not in danger since its inhabitants can be easily displaced to other parts of India.

If the political disputes are not resolved, the environmental crisis that occurs every year during the floods will worsen and will forcefully displace thousands of Bangladeshis, who will become environmental migrants. This case study will illustrate the situation, problems and possible solutions to avoid a catastrophe.
Examining ambient pm$_{2.5}$, pm$_{1.0}$ and black carbon personal exposure in nine locations throughout Mumbai during the winter season

Fred Rueger, Environmental Health (M)
Zohir Chowdhury, Public Health

A major contributor to air pollution is particulate matter (pm). pm is a complex combination of various sized particles which vary in source and chemical composition, and are formed from anthropogenic and natural sources. These particles can be categorized by their size (pm$_{10}$, pm$_{2.5}$, pm$_{0.1}$), and they are chemically made up of acids, organic chemicals, metals, and dust particles. There is no evidence of a safe level of exposure to pm or a threshold below which no adverse health effects occur. To analyze exposure to the population, transient or “Hot Spot” sampling was conducted in the winter months of 9 designated areas throughout Mumbai, India. Previous studies conclude that during the winter season, the city of Mumbai experiences the highest pm levels in comparison to other seasons due to meteorological factors. The 9 sampling sites were selected based on characteristics of the activities that represent the area (i.e. commercial, residential, slums, industrial, traffic, background, etc.). Sampling was conducted for 14 consecutive days, where each location was sampled twice for 30 minutes at a time. This study measured and compared pm$_{2.5}$, pm$_{0.1}$ (ultra-fine pm), and Black Carbon (BC) concentrations. As a component of pm, Black Carbon is formed as biofuels and fossil fuels combustion by-product. In addition to deleterious health effects similar to pm, BC has a strong global warming potential. For this experiment, 3 instruments were used: TSI DustTrak Aerosol Monitor, Aeth Labs Microaetholometer, and a TSI P-Trak. These instruments measure pm$_{2.5}$, black carbon, and ultrafine count concentrations, respectively. The highest observation of pm$_{2.5}$ was 236µg/m$^3$, which was recorded on 01/17/14 at the Sion location, and the highest ultrafine pm count was 73,977 pt/cm$^3$, recorded in the area of Andheri on 01/16/14. The total study sample average for pm$_{2.5}$ for all 9 sites was 122µg/m$^3$. A total of 8 of 9 sites exceeded the pm$_{2.5}$ World Health Organization air quality guidelines, as well as India’s National Ambient Air Quality Standards. This study contributes to establishing scientific baseline data for size isolated particulate matter, which could be used in the future studies to assess the efficacy of implemented emission control strategies.

Building a Combat Robot: The Design and Research Stages

Charles Joseph Casabar, Electrical Engineering (U)
Jenny Wong-Welch, Library and Information Access

Robogames is an annual event consisting of multiple robotics competitions. One of the events is robotic combat, consisting of two specially designed and constructed robots engaging in physical combat inside a protective enclosure. There are different weight classes, ranging from 150 grams to 100 kilograms, or 220 pounds. This presentation details the research process and design considerations for a 60 pound combat robot. The primary motivation behind this project was support in the form of supplies and guidance from a former combat robot builder. This helped to offset the financial costs and reduce the high chance of failure associated with constructing a combat robot with minimal previous experience.

The preliminary design process included research about the competition and past robots, as well as decisions for the basic configuration of the rob ot. After considering cost, complexity, and functionality, the participants decided on a four-wheel drive chassis with a motorized lifting arm. The next step in the design process consisted of comparing different materials and components for the device. Each piece of the robot had to be carefully selected due to the limited financial budget and weight allowance available. An online forum was utilized to ask for recommendations from veteran robot builders. Recommendations were used to focus the search for data on different components. Data was gathered in an online spreadsheet to compare different properties, such as voltage, power output, weight, and cost. The data and recommendations gathered were then used to guide purchasing decisions.

After completing the high-level design of the robot, the participants used computer-aided design (CAD) software to create a layout of the internal components of the robot and to calculate the distribution of weight in the robot. CAD software also enabled the use simulations to help determine an optimal configuration for the design of the robot and its parts.

With the date of the competition in April, data concerning the real-world performance of the design is unavailable. This presentation will provide preliminary results of the design process and the functionality of the design.
**Session B-4**

**Oral Presentation:** Interdisciplinary

**Friday, March 4, 2016, 11:00 am**

**Location:** Aztlan

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**165  11:15 am**

*Examining Food Waste Within a College Campus: Student Perceptions and Attitudes Towards On-Campus Dining Sustainability*

Karly Salcido, Speech, Language, and Hearing Sciences (U)

Vinod Sasidharan, Sustainability and Tourism Management

This project examined student perceptions regarding sustainability of San Diego State University dining services, and their willingness to help advance dining sustainability on campus. In the past two decades, green culture at universities has gradually increased. Studies have found that university campuses, faculty and students alike, consider themselves as being environmentally conscious with an invested interest in their campus’ sustainability. Innovations such as food composting and a week dedicated to sustainability are already in place at SDSU, but the university’s ecological footprint due to food waste, still needs to be reduced. This study proposed that students are not well aware of their consumption patterns and resultant generation of food waste, but, as students’ awareness regarding food waste increases, their interest in modifying consumption behavior shall increase as well. Secondly, when students are presented with visual measures of their dining waste and how to reduce it, they are more likely to act as advocates for reducing food waste. This study only focused on the student population that is expected to eat all of their meals on campus. Subjects for this study were first-year freshman who live in campus housing and are expected to consume all meals at SDSU dining locations, as part of their meal plan. Data was collected through a self-administered survey which examined awareness of sustainability, interest in sustainability, particularly in terms of decreasing food waste, estimates of consumption, and actual consumption. Findings revealed that students consumed more than they had expected and when presented with a visual representation of their waste, their willingness to adopt sustainability initiatives increased. Results from this study suggest that making students track their individual consumption can influence them to reflect on their behaviors and prompt them to address food waste in order to dine more sustainably at campus dining facilities.

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**166  11:30 am**

*Automatic Detection and Classification of Toothed Whale Echolocation Clicks in Diverse Long Term Recordings*

Scott Lindeneau, Computer Science (M)

Marie Roch, Computer Science

When extracting features for machine learning algorithms great attention must be placed on the quality of the features extracted. This work demonstrated the effectiveness and applicability of several ambiguity reducing techniques in the selection and extraction of features for toothed whale echolocation clicks from long term data collections across a variety of collection environments in the Southern California Bight. The ability to automatically detect and then classify a wide variety of species in a wide variety of environments demonstrates the promise of automating the time intensive process of manual annotation. We present results of classification to a variety of species on a 4 TB data set of recordings across a variety of locations and conditions in the Southern California Bight as part of the 2015 Intl. Workshop on Detection, Classification, Localization, and Density Estimation dataset. Echolocation clicks are identified via a multi-stage detection process that identifies potential echolocation clicks via their Teager energy and validates detections using spectral content and timing characteristics. Click spectra are normalized for background noise via spectral means subtraction, a process that has been shown to be effective for mitigating for site and instrument variability in the classification of echolocation clicks. To prevent weak echolocation clicks from contaminating the noise estimation process, candidate noise regions are validated with a click detector with a low threshold. Features are extracted from echolocation spectra using cepstral features that offer a compaction of the feature space, thus reducing dimensionality. These features are classified with a Gaussian mixture model. We introduce techniques to clean the input data, such as reducing the number of false detections triggered by anthropogenic sources. Our work demonstrates that toothed whale encounters are possible to detect for most species in a wide variety of environments. When classification is limited to encounters that human analysts can reliably identify, the system performs with 89% accuracy, but rejection of encounters that analysts cannot be reliably classified to species remains an open challenge (76% accuracy) for future investigation.
167  11:45 am
Enhanced Security Risks Due to International Disaster Response/Recovery Gaps
Jamie Mott, Homeland Security (M)
Eric Frost, Sciences

Terrorist radicalization is a trending topic throughout global media, politics and academia. Most commonly, when addressing populations vulnerable to radicalization, reports examine the mindset of prisoners, and those in areas currently in conflict-ridden areas. Less commonly explored, but addressed in this research, is the impact of natural disasters as it relates to terrorist recruitment and radicalization. Many studies have concluded that desperation, especially when paired with physical insecurity and sense of abandonment, can lead a neutral personality to turn toward terrorist organizations. This research, which infers that victims of disaster share such potential. While considering Maslow’s hierarchy of needs, this research describes how Nepal, and potentially other communities impacted by catastrophic natural disasters, are textbook candidates for terrorist recruitment and radicalization. Combining my background in international security and conflict resolution, with my experience in emergency management, I traveled to Nepal to research international response and recovery following the devastating earthquake of April 2015. While there, research was primarily on government entities, NGO structures, rural life post-earthquake, quality of life in the tent city and gaps in the recovery phase. Having previously experienced similar conditions in Haiti following the destructive 2010 earthquake, I compared my findings and found that disaster victims should be considered one of the most vulnerable, and easily recruited populations for future global terrorism.

168  12:00 pm
Underwater Probes
Jeffrey Sadural, CS (M)
Robert Edwards, CS

Underwater probes are used to take the measures of various conditions of the water in harsh environments. Such information is valuable in studying the ecology of our oceans and can be applicable to studies on the metagenomic content of the environment.

The cost of underwater probes can be prohibitive for hobbyists, students or professors looking to use them for various small-scale experiments. With the starting price for commercial grade probes starting in thousands of dollars, other ways of obtaining the data needed for study and experiments are constantly sought after.

With the advent of micro-controllers and open source projects such as the OpenROV, we have now been given an opportunity to create our own underwater probes and a fraction of the cost. Using local hardware store bought materials along with specialized hobby circuits and probes, we constructed our own underwater probes, looking to reduce the overall cost to further our studies. Modeled after the various projects in the open source community we fabricated an underwater probe for use in both freshwater and salt-water. These probes can also be constructed to sit on top of the water’s surface as well as be submerged indefinitely.

The biggest hurdle that we currently face is ensuring the accuracy of the probes. We are developing improved software and calibrations to deliver a product that anyone can build and use for their own studies and experiments for a fraction of the cost of commercial probes.

169  12:15 pm
Unsupervised Identification of Toothed Whales from Echolocation Clicks
Yun Trinh, Computer Science (M)
Marie Roch, Computer Science

There are many regions of the ocean where little is known about toothed whale species assemblages and where many species are not acoustically well understood. The ability to identify potential toothed whale species within a geographic region in an automated manner can provide spatiotemporal information that permits effective allocation of resources for further investigation and/or mitigation of human activities. Examples include spatiotemporal direction of visual survey effort and restricting anthropogenic activities such as seismic exploration to times/locations that are least likely to affect marine mammals.

In contrast to well studied areas where examples of echo location clicks recorded with visual confirmation of species identity, under studied areas are frequently lacking even basic population distribution information, and standard machine learning techniques that rely on learning from known examples are not applicable. In this study, we rely on unsupervised machine learning techniques that are capable of discerning structure from unknown data.

While echolocation clicks are highly related to toothed whale morphology, complicating factors for using echolocation clicks for species identification include that clicks are highly directional, subject to uneven frequency attenuation, and may be affected by an animal’s behavioral state. Consequently, rather than modeling individual clicks, the distribution of clicks from each toothed whale encounter is modeled using a Gaussian mixture model with the number of mixtures determined by a model selection criterion. Similarity between toothed whale encounters is measured by the symmetric Kullback-Leibler distance, and average-link clustering is used to construct a dendrogram. Preliminary results on data collected between 2009 and 2013 at seven recording sights throughout Southern California Bight are presented. The data contain echolocation clicks from five known species (Baird’s
Maturation of postural sway is influenced by gender but not by body mass index

Christina Frenchik, Pre-Physical Therapy (U)
Harsimran Baweja, Exercise and Nutritional Sciences

The purpose of this study was to determine the age by which children attain and exhibit adult-like postural sway characteristics during quiet unperturbed standing. In addition, we examined whether development of postural sway control was influenced by gender and body mass index (BMI). 391 children (Age range: 6-12 years; 49 females), 1555 children (Age range: 13-17 years; 273 females) and 2710 young adults (Age range: 18-24 years; 981 females) volunteered to participate in the study. The Balance Tracking System (BTrackS, San Diego, CA) force plate was used to assess the postural sway during quiet standing for all trials. Testing consisted of 3 trials of quiet standing with eyes closed; feet shoulder width apart and hands on the hips. Each trial lasted 20 seconds during which the total center of pressure (COP) sway, COP antero-posterior sway, COP medio-lateral sway path-lengths were calculated. A principle component analysis was used to calculate the 95 and 99% confidence intervals (CI) of the area within which the COP would lie. Overall, children from 7-12 years of age exhibited greater postural sway when compared with 13-17 year olds and young adults. However, 13-17 year old children exhibited similar postural sway characteristics to those of young adults. Females demonstrate lower postural sway irrespective of age. Furthermore, irrespective of age or gender, BMI does not influence postural sway. The 99% CI of COP area decreased significantly with age and accounted for ~40% of the variability in COP sway path-length. Our tests relied heavily on vestibular and proprioceptive integration as they were performed only with eyes-closed. Therefore, our findings are indicative of an inefficient multisensory integration in children up to the age of 12 years. Our findings support and extend previous findings suggesting that children do not exhibit adult-like sensory integration prior to the age of 12 years.

Postural control deficits in Division I athletes: the first 48 hours following mild concussions

Selena Mae Soria, Pre-Physical Therapy (U)
Harsimran Baweja, Exercise and Nutritional Sciences

Concussions are traumatic brain injuries that alter brain function. Effects are usually temporary but can include headaches, diminished concentration, poor memory, balance and coordination. Postural control assessments can provide a powerful means of detecting concussion-related neurophysiological abnormalities and are starting to gain traction as an essential part of concussion management processes. The purpose of this study was to determine the extent of postural control deficits accompanying mild concussions within the first 48 hours in Division I athletes. Preseason baseline balance testing of 519 healthy athletes playing sports with a relatively high risk for concussions was performed with the BTrackS Balance Test (BTrackS Inc., San Diego, CA). Of the baselined athletes, 26 (age range 18-23 years; 14 females) later experienced a concussion during the ensuing sport season. Post-injury balance testing was performed on these concussed athletes within 48 hours of injury. All pre- and post-injury tests were administered by certified athletic training staff. Additionally, 20 young adults (age range: 19-25 years; 10 females) with no history of concussions were baselined on 2 sessions 7 days apart. All testing consisted of 3 trials of quiet unperturbed standing with eyes closed; feet shoulder width apart and hands on the hips. Each trial lasted 20 seconds during which the total center of pressure (COP), COP antero-posterior (AP), and COP medio-lateral (ML) sway displacements were calculated. A principle component analysis was used to calculate the 95 and 99% confidence intervals (CI) of the area within which the COP would lie. Overall, there were no differences in any of the post-injury balance measures between athletes and control subjects. However, postural displacement in all directions (AP, ML, and Total) increased significantly in concussed athletes post-injury. Furthermore, 80% of the increase in COP excursions in the athletes was accounted for by a ~7 fold increase in the 99% CI of the COP area post-injury. Our findings are indicative of a decrease in postural control and multisensory integration within the first 48 hours post-concussion. Future studies should be aimed at investigating the long-term effects and recovery from concussions in these athletes.
172  11:30 am

Implementation of BTrackS for assessment of balance in individuals with stroke
Carly Graff, Kinesiology Pre-Physical Therapy (U)
Daniel Goble, Exercise and Nutritional Sciences

Background: Balance is necessary when performing basic daily activities such as walking, transitioning from a sitting to standing position, or reaching out to grab an object. In clinical settings, balance is typically measured using functional assessments such as the Berg Balance Scale. Unfortunately, such assessments tend to be subjective and can take up to 20 minutes to perform. The Balance Tracking System (BTrackS) is a new low-cost force plate that can provide a fast (<2 min), objective and reliable alternative for balance assessment in the field of physical medicine.

Objective: The purpose of this study was to demonstrate the feasibility of implementing BTrackS for the assessment of balance in individuals who have experienced a stroke. Methods: A total of 18 adults (mean age=56.4 +/- 12.5 years; 11 men, 7 women) with clinical diagnosis of stroke and 18 age-matched controls (mean age=56.2 +/- 13.0 years; 11 men, 7 women) participated in this study. Individuals with stroke were recruited from the Adaptive Fitness Clinic at San Diego State University and controls were from the local community. Each participant was balance tested while standing on the BTrackS force plate. Testing consisted of one familiarization trial and three experimental trials, each lasting 20 seconds. For each trial, participants stood as still as possible on the plate with their feet shoulder-width apart, hands to their sides, and eyes open. Balance ability was determined by the BTrackS software, which calculated the average amount of total sway across the experimental trials. Results: As expected, BTrackS was successfully implemented for the testing of individuals who have experienced a stroke. Specifically, data collected showed a significant difference in balance between participants who had a stroke compared to their age-matched controls (p<0.05). There was also a trend in the data (p<0.1) revealing that those who had more severe strokes exhibited worse balance than those who suffered a less severe strokes. Conclusion: BTrackS is potentially a better solution for monitoring balance changes in those individuals with stroke as it is fast, objective and reliable compared to standard functional assessments.

173  11:45 am

Dual-tasking inhibits postural control in older adults
Brad Taylor, Clinical Psychology (M)
Harsimran Baweja, Exercise & Nutritional Sciences

Postural control is accompanied with cognitive activities that are unrelated to posture in our daily lives. Both, postural control and cognition tend to deteriorate at different rates with aging. Therefore, the purpose of this study was to compare the effect of concurrent cognitive tasks on quiet unperturbed standing in young and older adults. Currently, 22 older adults (Age range: 60–90 years; 13 females) and 12 young adults (Age range: 18–21; 5 females) have taken part in the study. The Balance Tracking System (BTrackS, San Diego, CA) force plate was used to measure the postural sway. Balance testing consisted of 4 conditions: Single-task with eyes open, single-task with eyes closed, dual-task with eyes open and verbal memory encoding, and dual-task with eyes closed and digit span encoding. Subjects performed 3 trials per condition while standing with feet shoulder width apart and hands on hips. Each trial lasted 20 seconds during which the total center of pressure (COP), antero-posterior COP, and medio-lateral COP sway displacements were calculated. A principle component analysis was used to calculate the 95 and 99% confidence intervals of the area within which the COP excursions would lie. Additionally, subjects performed the verbal memory and digit span encoding tasks in a sitting position, while their balance was not being tested or challenged. The subjects’ error rates on the verbal memory encoding task and digit span encoding task were then calculated ‘on’ and ‘off’ the force plates. Our preliminary results suggest that when instructed to perform a demanding dual-task with eyes closed, older adults shift their attention away from postural control and their COP excursions decrease relative to the single-task baseline with eyes closed only, where attention is explicitly directed towards postural control. However, when performing the less demanding dual-task with eyes open, older adults do not show any differences in COP displacements relative to the single-task baseline with eyes open. Therefore, our findings are indicative of an interactive relation between the efficacy of postural control and concurrent cognitive demands, which reflect opposing trends in attentional resource competition in aging.
An effective exercise intervention to improve physical function in community-dwelling older adults

Katie Thralls, Health Behavior (D)
Susan Levy, Exercise and Nutritional Sciences

Introduction: Strategies for healthy aging reduce risks of diminished functional ability, loss of mobility, decreased quality of life, and loss of independence, often associated with aging. Physical activity shows potential to reduce these risks and improve physical function, and the maintenance of independence and well-being. Purpose: The purpose of this study was to examine the effects of a 3-month, instructor-led exercise class on measures of physical function in community-dwelling older adults. Methods: Participants were community-dwelling older adults (N=160, Mage=73.8 +/- 8.22 yrs) recruited from San Diego County senior centers, who volunteered for the study. Intervention (n=68, Mage=72.8 +/- 8.6 yrs) and control (n=92, Mage=74.6 +/- 7.9 yrs) participants were assigned based on demographically matched sites. Instructor-led exercise classes were offered in the intervention sites, twice a week. The 1-hour classes focused on strength, balance, flexibility, and aerobic endurance, with exercises modified for individual capabilities. Instructors were certified with backgrounds in group fitness and were specifically trained in the program content and proper biomechanics of all exercises. All participants were measured at baseline and at 3-months using 4 previously validated measures of physical function taken from the Rikli and Jones (1999) Senior Fitness Battery. Results: Mixed design 2(group) X 2(time) ANOVAs revealed significant interactions (p<.05) for all measures, with follow-up one-way RM ANOVAs indicating significant improvements in the 8-ft up and go (mobility; 12%), 6-min walk (aerobic endurance; equating to about 1/3 of a city block), 30 sec chair rise (lower body strength; 17.9%), and arm curl (arm strength, 16.5%) for those in the intervention group, while no improvements were found for controls. Conclusions: Exercise classes (one-hour, 2x/wk) over 3 months improved physical function, both statistically and in a clinically meaningful way compared to similar programs. These improvements may contribute to the maintenance of independent living and quality of life in older adults.

Y-Balance Test as a Predictor of Running-Related Injuries in High School Cross-Country Athletes

Natalie Ruffe, Physical Therapy (D)
Mitchell Rauh, Physical Therapy

Background: Cross-country is a popular interscholastic sport. With increased participation, however, an incidental increase in running-related injuries has also been observed. Recent literature suggests that functional tests may help to identify those at increased risk of injury. The Y-Balance Test (YBT) is an objective measure used to assess functional muscle strength, balance, and expose asymmetries between tested limbs. The upper quarter YBT (UQYBT) measures medial, inferolateral, and superolateral reach distances, while the lower quarter YBT (LQYBT) measures anterior, posteromedial, and posterolateral reach distances. Purpose/Hypothesis: To determine if 1) functional asymmetry, as determined by the upper and lower quarter YBT tests, is related to gender, and if 2) functional asymmetry is associated with increased risk of running-related injury. Methods: Male and female runners were recruited from four high school cross-country teams in San Diego. Each runner completed a baseline questionnaire assessing gender, height, and weight. At the beginning of the season, each runner completed the three reach distances for the LQYBT and UQYBT, respectively, for right and left limbs. The runners’ upper and lower limb lengths were also measured to normalize YBT scores. During the season, the coaches recorded their runner’s injuries in a Daily Injury Report (DIR). A running injury was defined as any reported muscle, joint, or bone problem/injury of the low back or lower extremity (hip, thigh, knee, shin, calf, ankle or foot). Results: Overall, 148 runners (80 females, 68 males) participated in the study. For the LQYBT, males had significantly greater anterior, posterolateral and posteromedial reach distances for right and left limbs (p<0.05) than females. Similarly, for the UQYBT, males had significantly greater medial, superolateral and inferolateral reach distances for right and left limbs (p<0.05) than females. When comparing right and left limb asymmetry for the six reach distances, no significant differences in asymmetry were found between males and females (p>0.05). Overall, 49 (33.1%) runners (48.8% females, 14.7% males) incurred an injury. Data analyses regarding the relationship between functional measures and injury will be reported in the final abstract. Conclusion: No significant differences in functional upper and lower limb asymmetry were found between males and female runners.
Session B-6
Oral Presentation: Chemistry for Analysis & Device
Friday, March 4, 2016, 11:00 am
Location: Templo Mayor

177  11:00 am
Interface Chemistry Between Glassy Carbon and Polyimide
Kyle Logan, Chemistry (U)
Samuel Kassegne, Mechanical Engineering

Polyimide and glassy carbon (a semi amorphous sp2 and sp3 hybridized carbon) are emerging materials in medical devices due to their relatively low cost, strength, and biocompatibility. However, little knowledge exists regarding their chemical interface. With this knowledge, a new generation of medical devices can be manufactured with improved efficiency and reliability. Thus, the interface between these materials is investigated in order to quantitatively define their bonding mechanisms, which was postulated to occur through carbonyl dimerization, and how these bonding mechanisms change when the materials are subject to various conditions. The samples were prepared using standard photolithography to create 1 micron structures of a polymer precursor. This precursor was carbonized and etched with oxygen plasma at three pressures, two between 300 and 600 torr, and one greater than 600 torr. Each pressure was done for 30 seconds and 2 minutes, generating a different batch of samples for each parameter. Each sample which was plasma etched at a given pressure was multiplied in order for a variation in curing temperatures (180°, 220°, 300°, 355°, and 395°) to be applied to the different carbon samples when they are cured with polyimide. These samples were then transferred to a polyimide substrate (Durimide 7510 and HD and MicroSystems HD4100) producing samples with 30µm of polyimide and 0.7 microns of Glassy Carbon protruding from the polymer surface. Fourier Transform Infrared Attenuated Total Reflectance (FTIR ATR) spectroscopy was performed through a diamond ATR crystal on these samples and compared with the FTIR of pure polyimide and glassy carbon as controls. Specific broadening of hydroxyl and carbonyl peaks coupled with carbonyl hydrogen bonding peaks at high frequencies was observed. These peaks prove the presence of hydrogen bonding between the polyimide and glassy carbon by carboxylic acid dimer peak broadening between the polymer and interface spectra. Rather than the predicted carbonyl dimer interface bonding, the data demonstrates carbon carboxylic acids and/or hydroxyls hydrogen bonding to polyimide through carboxylic acid dimerization.

178  11:15 am
Sample Encapsulation Post Electrophoretic Separation on Microfluidic Platform
Amy Vo, Chemistry (M)
Christopher Harrison, Chemistry

Microfluidic devices include a broad umbrella of techniques that involve the manipulation of micro-scale amounts of liquid, and they have grown in utility in several scientific fields, principle among these being bioanalysis, cellular biology, and microelectronics. An obvious advantage of microfluidic devices is their small size, which often translate to financial benefits stemming from inexpensive fabrication techniques, short analysis time, and low solvent consumption.

By using inexpensive and readily available chromatographic parts (e.g tubing, union and fittings), we have been able to engineer a microfluidic device that is capable of performing capillary electrophoretic (CE) separations with the added dimension of analyte encapsulation post separation. Traditionally, it is challenging to capture analytes following a CE separation as the components elute in nano/picoliter bands into milliliter-sized vials of buffer. Through our instrument design, the aqueous electrophoretic eluent is fed into a continuous stream of hydrophobic silicon oil. The interface between the streams of aqueous and hydrophobic liquids is designed to continuously form discrete, uniform, and nanoliter volume droplets. The separated analytes exiting the capillary are encapsulated by the oil phase and remain so until further study (NMR, LC-MS etc) and manipulation. Our device combines the strength of CE with the benefits of a microfluidic design in a way that opens up new possibilities for post column studies and detection schemes.

179  11:30 am
Enhancement of Solar Cell Activity by the Attachment of Silver Nanoparticles
Nobuyuki Yamamoto, Chemistry (D)
David Pullman, Chemistry

Solar cell efficiency has improved significantly in the past decade; however, it is limited mostly to laboratory settings. The goal of our research is to enhance solar cell activity in a simple and cost-effective manner. An important issue with the most common type of solar cells, which are fabricated from silicon, is that the performance of the solar cell decreases in the red and infrared regions of the electromagnetic spectrum. Thus, these regions of the solar spectrum are wasted.
Our approach to overcome this issue is to attach silver nanoparticles (AgNPs) to the surfaces of silicon solar cells. The AgNPs absorb and scatter light more intensely than any other material. Another unique and useful property of AgNPs is that the absorption range can be tuned by changing their size and shape. These properties can be taken advantage of; in particular, the AgNPs can be tuned to absorb and scatter red and near-infrared radiation. These AgNPs can be attached to the silicon solar cells using linker molecules, and we hypothesize that the efficiency of solar cells will improve.

Two organic linker molecules were synthesized in the laboratory. These were used to bridge the silicon wafer and AgNPs. The structures of the linker molecules were confirmed by 1H-NMR, FTIR, and X-ray diffraction. To simplify our initial studies, we used silicon wafers as mimics of silicon solar cells. The native oxide layers of silicon wafers were hydrogenated to make the surfaces reactive. Then, the wafers were immersed in a solution of linker molecules. Finally, a solution of AgNPs was reacted with the linker-attached wafers. Attachment of linker molecules in this bottom-up approach was checked by a germanium crystal based ATR-FTIR, while attachment of AgNPs was verified by UV-Vis-NearIR reflectance spectroscopy and by scanning electron microscopy.

Ultimately, this process will be repeated on the actual solar cell system. This approach is inexpensive because nanoparticles are deposited as a monolayer. It is also possible that this technique can be applied to solar cells made from other materials besides silicon.

180 11:45 pm
Substituent Effects on Fluorescent, Tricyclic Cytidine Analogues
Dillon Burns, Chemistry (D)
Byron Purse, Chemistry and Biochemistry

Fluorescent nucleotides have been shown to be useful molecular probes as well as fluorescent labels and they play a central role in the study of biophysical processes involving nucleic acids. Work done by our group and others has recently shown that the tricyclic cytosine class of compounds is capable of mimicking cytidine triphosphates when used as substrates for DNA and RNA polymerases and maintaining its bright fluorescence once inside the duplex. These properties making them exceptionally rare in the world of fluorescent nucleotide analogues. Our group is seeking a deeper understanding of what properties make our compounds good fluorophores in the context of biological systems. By synthesizing new tC derivatives and incorporating them into SS and DS DNA via solid-phase DNA synthesis, we can see how our molecules behave in their target environments and how neighboring base pairs affect the fluorescence of our compounds. Using synthetic chemistry, we have recently made both the brightest ((8-CN)tC°) and least bright ((8-diethylamino) tC) tC derivatives which has helped to show how electron donating and electron withdrawing groups affect fluorescence. Having such a range in quantum yields with the same scaffold elucidates the versatility and potential applications of our compounds as both molecular probes and fluorescent labels. The information and lessons learned from these photo-physical studies will help to guide us in the next round of design and synthesis of new, more responsive tC derivatives.

Session B-7
Oral Presentation: Kinetics & Catalysis
Friday, March 4, 2016, 11:00 am
Location: Visionary Suite

181 11:00 am
Unraveling tumorigenesis: how the kinetics of mutant IDH alter the tumor microenvironment
Eric Gonzalez, Biochemistry (U)
Christal Sohl, Chemistry and Biochemistry

Isocitrate dehydrogenase (IDH) is an important metabolic enzyme that is mutated in 80% of low-grade and secondary gliomas, and is found in many other cancers including glioblastoma multiforme, chondrosarcoma, and pancreatic cancer. Genetic analysis has shown that IDH mutations are among the first to occur in these tumors. IDH catalyzes the oxidative decarboxylation of isocitrate (ICT) to alpha-ketoglutarate (aKG). Many IDH mutations lose the ability to catalyze the wild-type reaction, but gain the neomorphic production of 2-hydroxyglutarate (2HG) from aKG. 2HG is a proposed oncometabolite, inhibiting enzymes involved in hypoxic response and in epigenetic regulation. Additionally, many mutations disable the wild-type reaction, have no neomorphic activity, and are still seen in cancer. Further work needs to be done in elucidating the mechanism by which mutant IDH1 produces 2HG, and characterizing the relationship between IDH1 mutations and cancer progression. Using Michaelis-Menten and transient state kinetics, this study aims to compare the molecular mechanisms of wild-type IDH1 with two mutants, R132H and H133Q. R132H is among the most frequent of IDH1 mutations and is known to produce 2HG. H133Q is not a known producer of 2HG. A detailed mechanistic comparison will give insights into how the mutations change the function and reactivity of IDH, and how these changes may lead to alterations in the tumor microenvironment.
Ab initio Kinetic Model for Parallel Addition Reactions of Open-Shell Combustion Intermediates

Pierre Winter, Chemistry (M)
Andrew Cooksy, Chemistry

We have developed a kinetic model for addition reactions of the acroleinyl (C3H3O•) and butadienyl (C4H5•) radicals each with C2H4, CO, and CO2. These radical species exhibit isomers separated by little or no barrier, where the less stable 1,3-dienyl radicals lead to more stable products than the 1,2-dienyl (allylic) radicals. Optimized geometries and vibrational modes were computed with the QCISD/aug-cc-pVDZ level and basis and single point energies were computed with the CCSD(T)/aug-cc-pVDZ level and basis. Our findings indicate that the kinetics and thermodynamics both favor reaction along the 1,3-dienyl pathway. However, the difference between the transition state energies of the 1,3 and 1,2 pathways in all reactions are predicted to be much less than the difference in product energies. Kinetic analysis predicts that a significant mixture of products will be formed at combustion temperatures.

A Highly Selective and Efficient Coordinatively Unsaturated Ruthenium Isomerization Catalyst

Erik Paulson, Chemistry (D)
Douglas Grotjahn, Chemistry & Biochemistry

In 2014, our group published a homogeneous bifunctional ruthenium catalyst (1 + 2) for the unprecedented selective isomerization of unfunctionalized linear 1-alkenes to E-2-alkenes with >95% yield. This preferential monoisomerization of 1-alkenes is catalyst controlled, allowing for broader substrate scope as opposed to most monoisomerizations, which are substrate-controlled.

For mixtures of 1 + 2, the rate of isomerization is dependent on the total amount of acetonitrile in solution; addition of an additional equivalent of acetonitrile to the above mixture slows the isomerization by a factor of 22. This work describes the synthesis, characterization, and catalytic activity of an acetonitrile-free version (3) of the monoisomerization catalyst, showing a rate increase of >400 over 1 + 2. Electron-poor catalyst 4 will also be discussed, with emphasis on comparisons of reactivity. X-ray crystal structures of 3 and 4 show formally 16-electron species in the solid state.
regioselectivity was observed with the chlorination of phenol in the presence of a chiral bis-thiourea. We then hypothesized that we could augment the innate reactivity of phenol by synthesizing a new Lewis base with added steric bulk. Chlorination of phenol using catalytic amounts of the sterically bulky Lewis base even further favored the formation of p-CI-phenol, supporting our hypothesis. We have observed a similar trend in regioselectivity across a wide range of substituted phenols. Moreover, phenols with notable functional groups were shown to increase regioselectivities even further. This work opens the door for mild, catalyst-directed electrophilic aromatic substitutions on both simple and complex arenes.

185 12:00 pm

Kinetic Study of Silver Nanoparticle Synthesis
Sonya Steffens, Chemistry (D)
David Pullman, Chemistry and Biochemistry

Silver nanoparticles in aqueous solutions are most commonly synthesized by reducing silver ions with sodium borohydride. Sodium citrate is added as a capping agent, stabilizing and limiting the size of the nanoparticles. The net reaction is understood well, but its mechanism is not. The purpose of the current work is to describe the mechanism of this reaction in as much detail as possible.

During the reduction of silver ions with sodium borohydride, the hydride ions are oxidized, and there have been different reactions proposed in literature. For example, \( \text{Ag}^+ + \text{BH}_4^- + 3\text{H}_2\text{O} \rightarrow \text{Ag}^0 + \text{B(OH)}_3^- + 3.5\text{H}_2\text{O} \) and \( 8\text{Ag}^+ + \text{BH}_4^- + 8\text{OH}^- \rightarrow 8\text{AgO} + \text{H}_2\text{BO}_3^- + 5\text{H}_2\text{O} \) are two of the these. The big difference is the production of \( \text{H}_2 \). We have built an apparatus that allows us to sample gas phase species evolved during this reaction in order to monitor the progress of the reaction and help elucidate the mechanism.

Our apparatus employs mass spectrometry and is able to detect masses below 4 amu, so the hydrogen production can be monitored sensitively. A burst of hydrogen is detected as soon as sodium borohydride is introduced into the reaction chamber. Sodium borohydride reacts with water to produce hydrogen gas, but the rate at which this reaction occurs is much slower than what we observe. A novel cold trap that is not isotopically sensitive allows the reaction to occur at atmospheric pressure. The trap condenses all components of air, but lets hydrogen and its isotopes through to the mass spectrometer. This allows us to perform isotopic substitution experiments to determine the origin of the hydrogen gas produced during the reaction. Additionally, to ensure that the gas species are being thoroughly mixed and sampled uniformly, a magnetically coupled propeller has been built to mix the headspace above the reaction.

Currently we are in the process of calibrating the signal so that the partial pressure of hydrogen can be calculated and used to determine how much hydrogen is produced per one silver ion and one borohydride ion. This information will be integral in elucidating the mechanism of the overall reaction.

186 12:15 pm

Molecular Solutions to the Energy Crisis
Jayneil Kamdar, Chemistry (D)
Douglas Grotjahn, Chemistry

There is an overwhelming consensus in the scientific community that global warming is the result of a rise in anthropogenic greenhouse gases since the Industrial Revolution. Amongst the greenhouse gases thought to effect global warming, carbon dioxide (\( \text{CO}_2 \)) appears to be the greatest culprit. \( \text{CO}_2 \) is generated as a byproduct of the combustion of fossil fuels – which is currently our primary source of energy. According to the Environmental Protection Agency, in 2012, \( \text{CO}_2 \) accounted for nearly 82% of all greenhouse gas emissions in the United States. With \( \text{CO}_2 \) implicated as the major contributor towards global warming, it is imperative that we end our dependence on carbon-heavy fuels and make the shift to a clean and renewable source of energy.

One idea is to derive hydrogen gas, a well-known fuel, from water by splitting water into its two component parts as per the following balanced reaction: \( 2\text{H}_2\text{O} \rightarrow 2\text{H}_2 + \text{O}_2 \). The beauty of this route is that there is no carbon involved in the process and therefore no \( \text{CO}_2 \) is formed as a byproduct. However, despite its simplicity on paper, water splitting is a difficult reaction because it requires a large amount of kinetic energy to overcome its inherently high activation barrier. Our strategy to overcome this problem is to use molecular organometallic complexes to sufficiently lower the activation barrier so that water splitting may become efficient and cost-effective enough to be implemented on a mass scale. More specifically, we are exploring the effect of manipulating a key geometrical parameter in an existing well-known ruthenium catalyst to drastically improve its catalytic activity.
187  11:00 am
Comparative Analysis of the Healing Magic of Greco-Romans and Post-Contact Mesoamericans
Mark Jones, History (M)
Elizabeth Pollard, History

This paper offers a comparative analysis of the healing rituals found in texts from both late Greco-Roman antiquity and Colonial Mesoamerica. The documentary sources used in this study are published translations of incantations from both cultures: for the Greco-Roman spells Hans Dieter Betz’s *The Greek Magical Papyri in Translation* (PGM) and on the Mesoamerican side, Ralph L Roys’ *Rituals of the Bacabs* (for Mayan incantations) and Hernando Ruiz de Alarcón’s *Treatise on the Heathen Superstitions That Today Live Among the Indians Native to This New Spain, 1629* (for Aztec incantations).

This examination of the healing incantations, ritual experts, and their use of flora and fauna reveals both similarities and differences. Because of the impossibility of direct knowledge transfer between the Greco-Roman Mediterranean and pre-Columbian Mesoamerica, this study explores how the inherent knowledge creation found in observation and experimentation and how the limits in that understanding, together can result in similar supernatural belief systems. While divination is extensively used in both cultures, this study demonstrates that Mesoamericans use it in ailment diagnosis and treatment selection; but this is not the case in the Greco-Roman record. This paper’s comparison raises questions in two significant areas: first it exposes significant absences of certain ailment types between two cultures (some explained and some not) and second it recognizes how academic perspective in the two fields influences the analysis of ritual, or magical, healing.

While previous investigations of magic in colonial Mexico have focused either on Inquisition accusations or on the agency of African women who brought their traditions with them from their home countries this comparative examination of the topic is new to the field. Because research on ritual healers and healing magic in the Greco-Roman world is more common, by adopting that model this comparative analysis has uncovered a new and exciting approach to studying similar practices in Mesoamerica.

188  11:15 am
Deficiencies in Antigen Presentation in African American Prostate Cancer
Harmony Saunders, Cellular and Molecular Biology (M)
Kathleen McGuire, Biology

Prostate Cancer (PCa) is diagnosed in over 200,000 patients and results in 27,000 fatalities annually. African Americans (AA) have PCa diagnosis and death rates 1.6 and 2.3 times higher, respectively, than Caucasians (CA). Many factors can contribute to the racial disparity, including immunity, which plays an important role in patient prognosis for several cancers. We hypothesize that differences in the anti-tumor immune response may contribute to the racial disparity in PCa. Previous studies in the lab analyzed existing microarray data from PCa tumors, comparing CA and AA patients, to identify immune genes differentially expressed by race. These studies identified two major histocompatibility complex (MHC) molecules, HLA-DMB and -DPA, that were higher expressed in CA tumors (8x and 128x higher, respectively) when compared to AA tumors. Using immunohistochemistry on hundreds of AA and CA patient samples, we confirmed this difference at the protein level. HLA-DMB and -DPA are MHC class II molecules that assist in presenting foreign peptides to CD4+ T cells, which can activate CD8+ T cells and trigger the anti-tumor immune response.

MHC class II genes are transcriptionally regulated by the class II transactivator (CIITA), which is activated by interferon-γ (IFNγ) to induce class II expression (including HLA-DMB and -DPA). In breast cancer, IFNγ-induced expression of CIITA decreases in the presence of estrogen, thereby decreasing class II expression and anti-tumor immunity. AA men have higher serum estrogen levels than CA men and estrogen is known to increase PCa progression and aggressiveness. Therefore, we have expanded our hypothesis to include that differences in class II gene expression between AA and CA PCa tumors may be influenced, at least in part, by estrogen. We are testing this by exposing existing PCa cell lines to estrogen and IFNγ and then examining the expression of antigen presentation genes at the RNA level using quantitative polymerase chain reaction (qPCR). Our preliminary results indicate that in the presence of estrogen, the expression of CIITA, HLA-DMB and -DPA are reduced. These results imply that estrogen impacts the anti-tumor immune response in PCa and may contribute to the racial disparities observed in this disease.
Assessing Obesity Among Native Hawaiians and Pacific Islanders in San Diego
Adrian Bacong, Public Health (M)
Christina Holub, Public Health

BACKGROUND: With largely multi-ethnic, multi-racial heritage, Native Hawaiian and Pacific Islanders (NHPI) are one of the fastest growing minority groups in the U.S. The high degree of "cultural integration" may contribute to health behaviors of NHPIs. Currently, NHPI experience greater disparities in obesity and other chronic diseases. Acculturation significantly contributes to obesity among Latinos and Asians, but little research has examined the acculturation of NHPIs and considered potential contributions of cultural integration. OBJECTIVE: To examine the extent that acculturation and cultural integration contribute to BMI within San Diego's NHPI community. METHODS: Data were taken from the 2013–2014 Pacific Islander Community Health Study, a cross-sectional study examining health disparities in San Diego’s NHPI community. Participants (n=163) completed a community survey about demographics, health, and health behaviors. Anthropometric measures were gathered to calculate participants’ BMI. Acculturation and Cultural Integration were measured using the Acculturation, Habits, and Interests Multicultural Scale for Adolescents (AHIMSA). Regression analyses were used to examine the effects of acculturation or integration on BMI. RESULTS: Mean BMI was 32.73 (SD = 7.92). Mean Acculturation and Cultural Integration sub-scores were 1.86 (SD = 1.92) and 5.06 (SD = 2.39), indicating “low acculturation” and “moderate integration” on the AHIMSA scale, respectively. AHIMSA scale items were internally consistent (α = .76). Linear regression revealed that both acculturation (F(1, 153) = 1.11, p = .29) and integration (F(1, 153) = .38, p = .54) were not significant for BMI. After controlling for demographic factors, fast food, dessert, and sugary beverage consumption, acculturation became marginally significant (F(1, 118) = 3.11, p = .08). Only ethnicity significantly contributed to differences in BMI (F(2, 118) = 6.67, p < .01).

CONCLUSION: Acculturation and cultural integration had minimal contribution to BMI/obesity within NHPI. The small sample size is a limitation. While the AHIMSA scale may possess good internal consistency, it may be inappropriate for this population, given the higher mean integration sub-score and the significant number U.S. NHPI that identify as multiple races/ethnicities. Future studies should consider development and validation of an acculturation scale that caters to the high degree of integration within the NHPI community.

Understanding Barriers to Physical Activity Among Native Hawaiian and Pacific Islanders in San Diego, CA
Liki Porotesano, Public Health (M)
Christina Holub, Public Health

BACKGROUND: Native Hawaiians and Pacific Islander (NHPI) people are one of the fastest growing ethnic groups in the US and experience numerous disparities in health, including obesity, diabetes, cardiovascular diseases and cancer. Barriers to physical activity experienced by NHPI may contribute to the high prevalence of obesity and obesity-related diseases. Extensive research has been conducted among minority communities, however there is limited research exploring barriers to physical activity in the NHPI community. OBJECTIVE: This study aims to understand the gap in knowledge surrounding barriers to physical activity among NHPI population in San Diego, CA. METHODS: Data was collected in 2013–2014 from the Pacific Islander Community Health Study, a cross-sectional study assessing health disparities amongst NHPI in San Diego. Participants completed a community survey (n=163), which included demographics, physical activity levels, and barriers to participating in a health program. An independent sample t-test was conducted to compare minutes of moderate-to-vigorous physical activity (MVPA) per week to each identified barrier. Additionally, this study analyzed whether the number of barriers were associated with MVPA. RESULTS: Transportation, family care, and tiredness were the top reported barriers to MVPA. There were no significant differences in MVPA, however, among participants who indicated transportation as a barrier (M=291.5, SD=338.9; t(105) = .793, p = .429), family care (M=330.1, SD=380.5; t(105) = .120, p = .905), and not knowing staff personally (M=341.0, SD=435.1; t(105) = .341, p = .734), even after controlling for age, education, ethnicity and gender. Number of barriers (M=1.12, SD=1.03; f(1, 105) = .135, p = .71) also did not make a different with regards to MVPA. Ethnicity and age were found to be associated with physical activity. CONCLUSION: Inadequate physical activity levels within the NHPI community have supported past research of high prevalence of obesity within this vulnerable population. Although there is no difference in MVPA based on the type and number of barriers identified, ethnic and age difference were found. Further research into culturally tailored programs that increase MVPA in the NHPI community is essential to the prevention of obesity and related diseases.
Many people visit oriental clinics to get an acupuncture treatment for their illnesses. Recent studies reveal that acupuncture and herbal medicine can help to prevent cancer or to alleviate the conditions of patients that are suffering from cancer. Although the significance of oriental medicine is increasing, only a few studies, in doctor and patient interaction during in-clinic treatments, are being conducted. This research aims to provide information about how a doctor and a patient deal with the symptoms in an oriental clinic. Conversation Analysis (CA) is employed to examine the interaction between a Korean doctor and his patient. The data is drawn from the conversation of a doctor and his patient in the Bosangjo oriental medical clinic in South Korea. This paper focuses on the importance of examining oriental medicine, pulse taking, understanding the Korean conversation, and needing more cases for evaluating the situations in which patients are having acupuncture treatments.

Coping is the mechanism through which individuals process stressful events (Moos & Holahan, 2003). Chun, Moos, and Cronkite (2006) propose a cultural transactional model of stress and coping in which culture and the personal system, such as self-esteem, interactively influence perception of stress, coping methodologies, and psychological outcomes. This study analyzes the applicability of the model to a sample (N = 219) of maltreated adolescents (age 18) from the Longitudinal Study of Child Abuse and Neglect (LONGSCAN) across three ethnic groups (89 African American, 41 Latino, 89 White) using the Adolescent Coping Orientation for Problem Experience (A-COPE), Trauma Symptom Inventory, Rosenberg Self-Esteem Scale, and questionnaires on community involvement and the importance of spirituality.

We hypothesized that culture would predict positive and negative coping strategies, protective factors (community involvement and spirituality), and trauma symptoms, directly or indirectly through self-esteem. To test this, we first conducted multiple regression analyses and found that the African American (AA) group 1) engaged in more positive coping compared to the White group ($r^2 = .06, b = 10.996, p = .003$) and the Latino group ($b = 14.082, p = .003$), and 2) was less likely to use drugs, alcohol, or smoking as coping strategies compared to the White and Latino groups ($r^2 = .02, b = .687, p = .032$). The AA group also showed more community involvement than the Latino group ($r^2 = .09, b = 1.058, p < .001$) and the White group ($b = .776, p < .001$). Both the AA ($r^2 = .11, b = .790, p < .001$) and the Latino groups ($b = .412, p = .036$) were found to regard religion as more important than the White group. No significant relationship was found between coping and trauma symptoms for the group overall. However, moderation analyses found that higher self-esteem strengthened the negative relationship between a positive coping orientation and specific tension reduction behaviors ($r^2 = .17, b = .005, p = .016$).

These results indicate that both cultural and personal systems are relevant factors to consider in studying coping strategies and protective behaviors that may subsequently predict trauma symptoms. Further analyses will explore the pathways through which culture predicts perception of stress and coping strategies.

**Session C: Oral Presentations**

**Session C-1**

**Oral Presentation: Autism**

**Friday, March 4, 2016, 1:00 pm**

**Location: Pride Suite**

Introduction: Research on autism spectrum disorder (ASD) has indicated atypical connectivity between cerebral cortex and deep structures such as thalamus and cerebellum. Recent intrinsic functional connectivity (iFC) work has shown predominant thalamocortical (TC) underconnectivity, but cerebrogocerebellar (CC) overconnectivity in ASD. However, these studies suggested similar domain-specific patterns of stronger iFC for sensorimotor (SM) and weaker iFC for supramodal (SU) connections. The present study examined these relationships by testing whether differential effects for SM and SU domains might be linked between thalamocortical and cerebrogocerebellar iFC. Methods: 42 ASD and 43 typically developing (TD) participants, 7–17 years old, completed a 6 minute resting state scan. Data were preprocessed in AFNI, with motion and fieldmap correction, spatial smoothing to 6mm3 full-width half max, and Talairach normalization. Cortical regions of interest (ROIs) were obtained from the Jülich histological and Harvard-Oxford atlases. Partial correlation...
analyses were performed between mean time series from each unilateral cerebral cortical ROI and each ipsilateral thalamic and each contralateral cerebellar voxel. Results: In general, ASD group showed more significant inter-domain (i.e. sensorimotor to supramodal) correlations. There was a significant main effect of group membership on number of inter-domain correlations (p<.05). When group-level correlations were averaged within sensorimotor, limbic, and supramodal domains, the ASD group exhibited several inter-domain correlations that were significantly higher than the TD group. Conclusions: Findings suggest that atypical TC and CC connectivity in ASD is not governed by a single principle of increased sensorimotor vs. reduced supramodal iFC. In general, ASD brains showed increased inter-network (thalamocortical with cerebrocerebellar) correlations. This effect was found both within-domain (e.g., temporal SU and parietal SU) and between domains (e.g. SM to parietal SU). Findings suggest an overall reduced differentiation in ASD between cerebral cortical regions with respect to their thalamocortical and cerebrocerebellar connectivity, and between thalamic and cerebellar circuits themselves. This indicates that the previous evidence of reduced network differentiation or segregation in ASD within cerebral cortex also applies to ‘deep’ connectivity with thalamus and cerebellum. Future directions include investigating this effect further to see if the group-wise patterns of network relations also characterize the nature of functional organization within individuals.

**194  1:15 pm**

**Links between local and long distance functional connectivity in Autism Spectrum Disorder**

Sangeeta Nair, Psychology (M)
Ralph Axel Mueller, Psychology

Autism spectrum disorder (ASD) is an increasingly prevalent neurodevelopmental disorder characterized by repetitive behaviors and impaired social communication and interaction. There has been a growing consensus that behavioral and brain abnormalities can only be explained at the level of interconnected networks. Evidence indicates atypical long distance connectivity in ASD and a few recent studies have found atypical local connectivity as well. However, aside from theoretical speculations about reduced increased local and reduced long-distance connectivity, there is little empirical evidence on how abnormal local connectivity relates to long distance connectivity. A specific question is whether local overconnectivity may indicate relatively isolated processing or overly integrative processing. Archival functional MRI resting state data were available for 42 children and adolescents with ASD (7–18 y/o) and 43 typically developing (TD) participants matched for age, motion, and non-verbal IQ. These data underwent a standard fMRI preprocessing pipeline including motion, slice-time, and field map correction, spatial smoothing and bandpass filtering, and removal of nuisance regressors (6 rigid-body motion parameters, white matter, ventricles). Regional homogeneity (ReHo) was used to examine local connectivity, and clusters of between-group differences were used as seeds in subsequent whole brain functional connectivity analyses. In the ASD group, local overconnectivity in posterior regions was mostly associated with underconnectivity in distal regions, suggesting a link between local over- and long-distance underconnectivity specifically for visual regions and reduced cooperation with frontal lobe in ASD. Locally underconnected left fusiform gyrus was underconnected with other visual cortices, including primary visual cortex. Cingulate and medial frontal regions showed extensive underconnectivity throughout medial cerebral cortex in the ASD group on both ReHo and whole brain analyses. Overall, the findings suggest that hypothesis of generally increased local and reduced distal connectivity in ASD requires modification, as it applies solely to some striate and extrastriate visual cortices, which are locally underconnected, but underconnected with some distal frontal regions.

**195  1:30 pm**

**Atypical intrinsic functional connectivity of core face perception system is associated with symptom severity in ASD**

Weiqi Zhao, Psychology (M)
Ralph-Axel Müller, Psychology

One of the core symptoms of Autism Spectrum Disorder (ASD) is a deficit in social communication. Individuals with ASD have impairments in face processing, a crucial component of reciprocal social interactions, including deficits in gaze processing and face identification. Given the observed deficits in face perception in ASD and the prevalent theory that ASD is a disorder of network dysfunction and abnormal brain connectivity, we examined the functional network organization of the core face perception system in children and adolescents with ASD using intrinsic functional connectivity (iFC).

We performed whole-brain iFC analysis using bilateral FFA, OFA and pSTS as seed regions (Tahmasebi et al., 2012) in 35 children and adolescents with ASD (aged 8–17 years) and 36 typically developing (TD) participants matched for age, gender, IQ, and in-scanner head motion. Between-group comparisons revealed two main clusters of differential iFC shared across most seeds. Underconnectivity (ASD < TD) with the right IFG, part of the extended face perception system (Fairhall & Ishai, 2007), was found for bilateral FFA, right OFA, and bilateral pSTS seeds. The degree of underconnectivity between right IFG and right FFA, and between right IFG and right OFA was correlated with ADOS-2 Total scores, such that weaker connectivity, compared to TD, was associated...
with greater symptom severity. Additionally, right FFA seed also yielded overconnectivity in or close to default mode network (DMN) nodes, including the mid orbital gyrus and bilateral angular gyri. The extent of overconnectivity between right FFA and DMN regions was also correlated with ADOS-2 Total scores: Individuals with ASD with greater connectivity between right FFA and DMN regions had more ASD symptoms.

Our findings indicate atypical iFC patterns of core face perception regions in children and adolescents with ASD. Individuals with ASD exhibited reduced segregation between the core face perception system and out-of-network regions, such as the DMN, and reduced integration between the core and extended face perception systems. The link between increased ASD symptomatology and atypical connectivity patterns of the core face perception system suggests that compromised face perception network integrity may contribute to social communication deficits observed in ASD.

A multi-step CRF dimensional reduction algorithm was used to split features into several sets of smaller chunks. Then CRF ran on each chunk in parallel and 40%–50% of top informative features were extracted from each set. These steps repeated until reducing dimension of the parameter space to 100 features. Result: After 8 steps of CRF dimensional reduction, the parameter space reduced from 58311 to 100 features with an OOB error of 21%. Further, the proportion of intra-network-connectivity significantly increased, while conversely the proportion of inter-network-connectivity decreased. Prominent networks were default mode, somatosensory motor-hand, ventral attention, cingulo-opercular task, cerebellar, and visual. Conclusion: Using small portion of features (0.0017) can improve diagnostic prediction of autism. The prominence of sensorimotor, visual, attention and default mode ROIs is in line with previous findings. The pivotal role of ROIs in cerebellum adds novel evidence to the growing literature in ASD.

Afrooz Jahedi, Computation Statistics (D)
Ralph-Axel Müller, Psychology

Background: Despite consensus on the neurological nature of autism spectrum disorders (ASD), brain biomarkers remain unknown and diagnosis continues relying on behavioral criteria. Random forest (RF) has successfully been applied to reveal complex patterns of biomarkers due to its capability in coping with small sample size and large number of predictor variables. However, RF is biased toward correlated predictor variables, which can affect variable importance measures and interpretability of the forests. In the presence of highly correlated functional connectivity MRI data, we used Conditional Random Forests (CRF) to minimize bias in the variable selection. Dealing with high dimensional parameter space, a multi-step CRF dimensional reduction algorithm were employed to maintain important information about ROI functional connectivities while significantly reducing computation time. Methods: We used resting state (rs)-fMRI data from 462 low-motion participants (222 ASD, 240 TD) from the Autism Brain Imaging Data Exchange (ABIDE), matched on age and 0.25 mm head motion. We chose 313 ROIs from Gordon et al. (2014), 13 subcortical and 15 cerebellum ROIs from Harvard-Oxford atlas. For each ROI pair, a feature was defined as functional connectivity (time series correlation; 58311 total features). To decrease computational time, we discretized the data for each feature into 2% bins, replacing each bin by its median.

Masculinity in Hawaii Five-O
Jana Peale, History (M)
Eve Kornfeld, History

“Book ‘em Danno” murder one.” Detective Steve McGarrett” Hawaii Five-O In the 1970s’ crime television dominated airwaves. This study examines how this widely consumed genre represented masculinity. As feminists gained a greater public voice during the decade, their ideals permeated the general consciousness. By challenging culturally accepted femininity, feminists called into question normative masculinity. At the same time other social and political conditions of the 1970s such as a feared urban crisis and rising police forces in cities made crime television relevant to American audiences. This presentation deconstructs one of the most popular crime shows of the decade Hawaii Five-O While some attempts were made to portray a more complex form of masculinity the TV show ultimately continued to construct a traditional gender hierarchy. Masculinity diversified but its superiority to femininity remained unchanged. Further, the shows continued to construct ideal masculinity as white and middle class. Representations of masculinity are understood through analysis of dialogue, interpersonal relationships, and physicality. The 1970s opened with great promise for feminist success, but 1980s conservatism began to reverse feminist gains. However, backlash was not a 1980s creation. Americans negotiated their understandings of gender in the 1970s. Crime television provided one important medium for such a conversation to take place.
Session C-2
Oral Presentation:
Faculty, Students, Identity & Behavior
Friday, March 4, 2016, 1:00 pm
Location: Park Boulevard

197  1:00 pm
The Impact of Faculty Diversity in California Community Colleges on Success of Students of Color
Oscar Duran, Social Science (U)
Angelica Palacios, Education

The number of diverse students in community college has risen to over 50% (Jeffcoat & Piland, 2012). Simultaneously, the percent of ethnic students in college continue to increase (NCES, 2015). As such, as diversity would become increasingly reflected within our communities, so would higher education facilities. However, the rate of ethnic faculty teaching at California community colleges has not increased (Jeffcoat & Piland, 2012). Fujimoto (2012) explains that 35% of college students are of color, yet faculty members at those institutions do not mirror the ethnic makeup of institutions’ majority population, i.e., 82% White faculty to 17% faculty of color ratio. This is of alarming concern seeing that the number of ethnic faculty members has not risen to meet the demands of the growing student population. In fact, research has noted that students of color benefit from the hiring of more faculty of color, as do students from non-ethnic backgrounds (Turner, 2000).

This study examined whether there were significant mean differences in students’ success rates based on the rate of full-time diverse faculty that resembled students’ own ethnic demographic across 113 California community colleges. This study was delimited to four racial demographics, Asian, Black, Latino, and Native. Sixteen one-way analysis of covariance (ANCOVA) were employed to analyze the dataset. The dependent variable for this study was basic skills success, and transfer success for males and females. The fixed factor was ‘full-time faculty’ and the control variable was ‘institution size.’

Findings from this study revealed that when full-time faculty demographics align with the demographics of the student population there is an increase in basic skills and transfer success. Analysis revealed nine statistically significant areas related to male and female success. In sum, findings indicated that there were statistically significant difference between students who had lower levels and higher levels of full-time faculty that mirrored students’ own ethnic identity when it came to basic skills and transfer success. As such, data would suggest that ethnic students would benefit from higher levels of ethnic faculty. Ultimately, institutions need to consider the ramifications hiring could have when considering success outcomes for students of color.

198  1:15 pm
Persistence in the community college: Men of color and engagement with faculty
Alejandro Arias, Foods & Nutrition (U)
Marissa Vasquez, Education

Statement of the Problem: Community college is considered to be the primary pathway into postsecondary education for many students from historically underrepresented and underserved communities, particularly males of color (e.g., Black, Latino, Southeast Asian) (Wood, Harris, Xiong, 2014). Yet, research finds that these men often depart from community college at higher rates than their White male peers (Wood, 2012). Additionally, the extant literature also revealed that institutional agents, such as faculty, staff, and counselors (Stanton-Salazar, 1997; Rendon, 1999) play a supportive role in the educational persistence and success of students of color. Given this, the current study sought to determine whether there were any differences in the intent to persist for men of color in the community college based upon engagement with faculty.

Methods: Using data from the Community College Survey of Men (CCSM), the sample included 941 respondents from one southern California community college district who self-identified as Black, Southeast Asian, or Latino. The dependent variable, faculty-student engagement, is a dichotomous (engaged, not engaged) composite variable consisting of four items regarding students’ interactions with faculty inside and outside of the classroom about academic and non-academic matters. The independent variable, intent to persist, consists of three levels (will not return, unsure, will return). One-way analysis of variance (ANOVA) will be employed in this study. Specifically, the analysis will focus on differences in faculty-student engagement on the intent to persist (1x3 design) among male students of color in the community college.

Results & Conclusion: The current study is in the early stages of data analysis. We anticipate to complete data analysis by the symposium presentation dates. Results from the study will provide insights for community college leaders and faculty to better support the persistence of male students of color in community colleges.
Faculty as Institutional Agents
Stephanie Estrada, Urban Studies (U)
Marissa Vasquez Urias, Education

Statement of the Problem: Men of color are more likely to begin their post-secondary education in two year institutions and are less likely to complete their college goals than their White male peers (i.e. degree attainment or transfer) (Wood, Harris, & Xiong, 2014). However, literature suggests that if students experienced a connection with faculty, they are more likely to succeed (Espinoza, 2012). Moreover, institutional agents (i.e. faculty, staff) who engage with the men of color and understand their lived experiences are better suited to mentor and help guide them towards success. Purpose: The purpose of our study is to understand faculty’s perceived levels of engagement of men of color in the community college. In addition, this study seeks to identify challenges and strategies in working with male students of color, in and out of the classroom. The following research questions will guide this study: 1) What patterns of engagement have faculty observed among men of color in their classes?; 2) What challenges do faculty members perceive men of color experiencing in being successful in college?; 3) What strategies have faculty found helpful in facilitating successful outcomes among men of color, both in and out of the classroom? Methods and Outcomes: Using a phenomenological research design, this study explored the perceptions of 30 community college faculty members who had experience with teaching men of color. Data collection included 10 one-on-one interviews and two focus groups with a total of 22 faculty participants. The interviews and focus groups were audio recorded and are currently being transcribed. Data will be analyzed via line-by-line coding methods using qualitative data analysis software. Conclusion: The analysis of this project is currently underway. Once the interviews and focus groups are analyzed, we will identify the common themes shared by the faculty participants of the study. The common themes shared by the participants will be the findings of this study.

Because I Said So: Parenting Styles and the Effects on Silencing, Sensation Seeking, and Risk Behaviors in College Students
Shane Wehlage, Communication (M)
Lourdes Martinez, PSFA

Family communication has been a topic of relevance for decades in the interpersonal communication field. Over these years, scholars advanced our understanding of the family unit and the associated characteristics that categorized families into classifications. Through these familial units, researchers can understand how the role of these two categories function within individual behaviors. Behaviors individuals engage in manifest from internal perception of a behavior occurring and the appropriateness of partaking in the action. Furthermore, the experiences that children go through during adolescence may predict the desire to engage in risky behavior, or sensation seeking, once they transition into college.

In this study, we are interested in understanding particular family types and their propensity to develop self-silencing techniques, experience of guilt or shame, and sensation seeking. We hypothesized that students from high conformity orientation family units have higher levels of sensation seeking. Furthermore, we believed that students from protective families are more likely to engage in self-silencing techniques and experience more guilt and shame.

Our sample included a large sample (N = 439) of participants who are college-level students from a large southwestern university. After running a multiple regression analysis, the data only supports one of the three hypotheses we constructed. According to the numbers, there was no strong indication that students were from high-conformity orientation families had high levels of sensation seeking (p = .639). Furthermore, students from protective families were less likely to experience guilt or shame (p = .390). The hypothesis supported from the data is that students from protective families did experience more self-silencing techniques (B = 3.543, p = .000).

Based on the results, students who come from protective families engage in more self-silencing techniques. This supports the silencing the self theory (Jack, 1991), but with modifications. The theory postulates that women in relationships that experience imbalances of power engage in self-silencing techniques, which leads to the women having depression because they experience a lower power status. We expand this theory to include family styles, instead of biological sex standards, in an attempt to understand childhood depression.
The purpose of this research is to explore the complexities of the work-life balance of tenured and tenure-track professors in the social and behavioral sciences. It is a comparative study between professors that teach in California Community Colleges (CCC) versus those that teach in public universities, such as the California State University (CSU) and the University of California (UC), focusing on the Southern California area. This research uses qualitative methods, the use of in-depth interviews with faculty members from the various institutions. Surveys are also administered prior to the interviews, in which respondents filled out information on their background. This study allowed for the emergence of patterns in the profession, and the analysis of the existing work policies that may aid or inhibit work-life balance among our local faculty members. The frameworks of family life course theory and role conflict theory allowed for the examination of how factors such as gender, stage of career, institutional type and professional responsibilities impact overall faculty work-life balance. Of the three types of public institutions of higher education in California, faculty interviewees from the UCs reported having better, and more varied family-friendly policies than both CSUs and CCCs. On average, university faculty reported working 50–70 hours a week whereas community college faculty reported working 40–50 hours a week. In terms of overall satisfaction with their work-life balance, tenured and tenure-track faculty members at UCs report being most satisfied with their work-life balance, followed by faculty at CCCs, with CSU faculty reporting the lowest level of satisfaction, on average. The data also showed that not only did faculty experience role conflict between work and family, but also within the work role itself, more specifically the role conflict between the teacher role and the researcher role were quite prevalent, which have traditionally been thought of as complementary.
204  1:15 pm

Half Time Teaching and Learning with an Intramural High School Robotics Competition
Lindsay White, Electrical Engineering (U)
Jenny Wong-Welch, Library & Information Access

In the Mt. Carmel High School robotics club in San Diego’s North County, high school students compete in the FIRST Tech Challenge (FTC), which ends in February of each year. Adult volunteers, called mentors, help facilitate the student’s learning on such subjects as design, programming, and building a robot. Due to the fact that the school year ends approximately four months after FTC competitions, student engagement within the club falters. In 2015, this need for challenge was met with an intramural competition created in the style of FTC. Taking into account the club’s financial resources and the stock of competition elements the club owned from previous competitions, the mentors designed the game. Drawing on their knowledge of past competitions and typical rule patterns for FTC, the mentors invented a game which compelled students to use and improve the skills they exercise in the official event on two separate teams.

The club held a competition day on a Saturday, which included six rounds of competition, and team interviews with adult judges working in STEM fields. The judges’ interviews were to assess each team’s design and build process, as well as their documentation, to give students a more authentic environment for the event. The result was a competition that accurately represented an official FTC event. Students continued to modify and improve their robots between matches, as well as completing all parts that are expected of competition day—a notebook recording their design and build process, an interview with adults in the industry, and, of course, matches. In this exercise, the students faced a second challenge in the style they are familiar with, and had the opportunity to continue to build their skills as robot designers, programmers, and builders, while the mentors learned about the difficulty of creating a competition for robots and the challenges of organizing and coordinating a competition event. The mentors also gained greater insight into the student’s work habits and strengths, as well as learned about the social dynamics of the group and how that affects the robot assembly process.

205  1:30 pm

Do Student Loans affect College Major Selection?
Jeremy Juybari, Economics/Quantitative Analysis/Interdisciplinary Studies (U)
Kangoh Lee, Economics

Current research regarding undergraduate major selection in public and private United States universities focuses on the impact of various factors—such as gender, race, discipline exposure, interest, and SAT scores—on major choice. Although the current studies are extensive, there is a dearth of information regarding the impact that student loans have on college degree selection. In light of the rising costs of education in the U.S., this study poses the question: How does the amount of student loan debt affect undergraduates’ major choice? And to what extent does a student’s skill set influence that decision process?

In this study, I used data from the National Center for Education Statistics (NCES) longitudinal survey, Beyond Post-Secondary, to construct a regression logit model using well established degree groupings. The data set is comprised of 16,700 students from four year public and private universities, community colleges, and for-profit schools. Also, the NCES survey methodology limits sample bias which in conjunction with the sample size allows the data set to accurately reflect student populations (cite). The combination of quality data and regression techniques enabled the estimation of the effect of loans on major choices separately from other possible effects. The key independent variables facilitating a control group included basic demographic information in concurrence with loans, financial aid, scholarships and grants. Additionally, I analyzed interactions between finances and demographics to see how educational funding influences different population segments.

Economic theory predicts indebted students to elect majors with perceived high earnings, unless the intrinsic value of the degree outweighs this. However, students who have loans and major in a degree with a low expected salary, would defy economic theory. For instance, a student who selects a major with potentially higher earnings but with a personal skill set unfit for the degree would create a loss, both individually and socially, due to a mismatch between skills and studies. This implies a policy implication that more advising or mentoring, formal or informal, may enhance an undergraduate’s well being as well as provide social benefits.
Fail Montezuma! The Last Vestiges of an Obscured yet Stubbornly Persistent Culture of Racism at San Diego State University

Ozzie Monge, MALAS (M)
William Nericcio, English and Comparative Literature

By any measure, San Diego State University boasts a very diverse student body. In fact, SDSU has been the recipient of the Higher Education Excellence in Diversity Award, a national honor, for two consecutive years (2013–2014). In spite of this distinction, SDSU still maintains a moniker and a mascot that were born during an era when the ideology of white supremacy was the accepted social norm. The school’s appropriation of Aztec culture in 1925 and the manner in which the students and faculty chose to use it demonstrates the ignorance that led to the consequentially racist misrepresentation of not only Aztecs, but of Indigenous people in general, with the most visible example being the school’s mascot. The mascot itself perpetuates the “noble savage” stereotype, reducing Indigenous people to anachronistic objects suitable for use as a good luck charm during sporting events; this is completely antithetical to SDSU’s achievements in diversity. Many fail to understand why the mascot is racist in nature. This may be due to the fact that the word “Aztec” itself is not as racially charged as the word “Redskin” or any other derogatory racial slur. However, when the history behind the selection of the Aztec moniker is examined within the context of the social climate in which it was chosen, it becomes clearly evident how racism articulated itself during the nascent formation of San Diego State’s identity. Combined with the erroneous and romanticized (mis)understandings of the geographic region and its history, racism influenced the choices made by students, faculty and administrators, which led to the original appropriation of the Aztec culture in 1925. The role that white supremacy and racism had in taking the “Aztec” name, as well as the inevitable introduction of a mascot based on a racialized stereotype that choice dictated, has been obscured by San Diego State (whether this was intended or not I leave for the reader to decide). My intention is to reveal the actual history behind the choice of the moniker and mascot, bringing into the open the facts which have been, over time, obscured, forgotten and perhaps even intentionally hidden.

Raising Standards: Experimental Peer Benchmarking and its Effect on Grade Point Average and Goal Orientation

Scott Plambek, Communication (M)
Brian Spitzberg, Communication

This study examines the effects of a common instructional communication practice: peer benchmarking; announcing the average class grade for previous exams and assignments. This intervention-experimental design uses 6 different instructors teaching three classes of the same introductory communication course using a total of 360 students. One class will be used as the control, and no average grades will be reported students. In the second class, an instructor will report the average grade of each assignment and exam to the class when appropriate. Finally, in the third class, a weighted “high average” will be calculated averaging the mean score and the highest score of the class. GPA scores will be collected at the end of the semester. Surveys on goal orientation will also be administered at the beginning and end of the semester to measure the effect of benchmarking on students’ goal orientation. Results will be discussed in regards to importance of instructional communication and the effect class averages have on social comparison of students, as well as the extension of ideas such as the Pygmalion effect, where higher instructional expectations create a self-fulfilling prophecy in academic performance for their students.

Students Attitudes to the Learning Glass

Polly Card, Education (D)
Marva Cappello, Education

Today’s students live in a media saturated world. Technology and media inhabit all aspects of students’ lives, and because of this it is important that educators harness it’s power through the effective use of technology and educational video. The role of video in education has been shown to benefit teaching and learning, boosting student engagement and learning outcomes. It has a key part to play in student success rates, particularly for those who speak English as a second language and in classes with large enrollments. Video also has the potential to meet demands of online, hybrid and blended classes where flexibility and economy are considered to be important elements.

According to a summary of recent research and educational surveys, video:

- Reinforces reading and lecture material
- Aids in the development of a common base of knowledge among students
The impact of video in blended and hybred learning represents an ongoing field of research. This study seeks to explore the attitudes of students towards the educational use of video and technology, and in particular, the Learning Glass. The Learning Glass has been developed at SDSU by Instructional Technology Services and Professor Matt Anderson. It is a low-cost, open technology that facilitates communication by allowing lecturers to look at their audience while writing on a transparent surface.

The Learning Glass has been designed to increase communication and help students to feel connected to, and form relationships with, their instructors (Anderson, 2015). Feeling connected and forming relationships are key predictors of persistence in STEM, especially for women and for students from underrepresented groups (Seymour, 2006; Good, Rattan, & Dweck, 2012). This study seeks explore the attitudes of students towards the Learning Glass videos. Descriptive and correlational results are reported and the reliability and validity of the two instruments are also examined.

Session C-4

Oral Presentation: Interdisciplinary

Friday, March 4, 2016, 1:00 pm
Location: Aztlan

209 1:00 pm

Revisions on the Traditional Model of Teaching Computer Science

Dennis Thompson, Computer Science (U)
Robert Edwards, Computer Science

In nearly every STEM major there are applications that exist to grade, proofread, and give feedback when invalid responses are provided. The traditional method of submitting source code, however, has a fundamental shortcoming: a lack of immediate feedback. This can lead to lower retention rates of students who struggle to grasp programming concepts. We propose a new system which will have students submit code to a version control system and they will receive immediate feedback on how their code performed within seconds of pushing their code to the repository. This will be achieved by using a git server and a Jenkins Continuous Integration server. In this approach we will also develop an end-to-end solution to compile, analyze, test, benchmark, check for plagiarized code, generate a comprehensive report for each student submission received, and upload grades to Blackboard or Moodle. In initial trials, it took on average 3.977 seconds to compile, generate an Abstract Syntax Tree, and run a reduced set of static analysis rules on 297 independent files. We implement and deploy the solution starting Fall semester 2016 and monitor the performance of students as they continue through the Computer Science curriculum to see the retention rates improve.

210 1:15 pm

“I Didn’t Know That Was Illegal”: A Portrait of SDSU Worker-Learners

Trevor Auldridge, Sociology (U)
Jill Esbenshade, Sociology

According to the San Diego State University Career Services website, about two thirds of SDSU’s 2013 graduating class held a job at some point while attending school. Although SDSU annually reports this information as well as the future job prospects of graduating seniors, there is clearly a lack of available data regarding the broader contours of the work lives of SDSU’s ‘worker-learners’” (Bernhardt et al. 2015). Through a convenience sample of approximately 3,000 students, we surveyed SDSU undergraduates in terms of these broader contours — average hours worked each week, industry, position, wages, on/off campus location, and labor violations — in order to give a window into the working realities of students and to necessitate labor rights knowledge as an integral part of undergraduate education. Our findings on labor violations echo national data on low-wage workers (U.S. Department of Labor 2014) — students were more likely to suffer violations in low-wage work, and students in the food and retail industries were most likely to report one or more violations — and our recommendations for SDSU reflect Bobo’s (2011) suggestions for universities: they can enhance the knowledge of students who are currently employed and/or will be employees/employers in the future by 1) establishing workers rights resource centers, 2) directing students to helpful worker rights websites, 3) distributing worker rights flyers, and 3) organizing worker rights educational programs.

211 1:30 pm

Shallow Waves in Density Stratified Bilinear Shear Currents

Theresa Morrison, Applied Mathematics (U)
Christopher Curtis, Mathematics and Statistics

In this presentation the role of nonlinearity on the evolution of surface and internal layers in density stratified fluids with steady but different shear currents in each stratified layer is examined. Our work addresses two physically motivated parameter sets which display a range of nonlinear phenomena. We also show, when the difference between the vorticities in each layer is
sufficiently large and of different signs, large amplitude nonlinear phenomena, particularly along the internal layer, emerges. Dispersive shock wave and solitary wave phenomena appear in the parameter regimes examined in this work. Our results show that jumps in density and vorticity generate strong nonlinear responses, and therefore sea state models should account for these variations in order to improve their predictive capabilities.

212 1:45 pm

*Designing optical metamaterials with hyperbolic dispersion based on Al:ZnO/ZnO nano-layered structure using Atomic Layer Deposition*

Priscilla Kelly, Computational Science (M)
Lyuba Kuznetsova, Physics

Development of the metamaterials with hyperbolic dispersion (HMM) has been a subject of recent research due to their unique optical property, namely that the dispersion of the dielectric function for HMMs exhibits a topological transition in the isofrequency surface from an ellipsoid to a hyperboloid. This important property of metamaterial with hyperbolic dispersion will offer the advantages of using this metal-dielectric HMM for applications in blue/UV LEDs and structural colors. In this work, our goal was to design and fabricate a nano-layered Al:ZnO/ZnO metamaterial using the Atomic Layer Deposition (ALD) technique. Experimental dielectric functions for Al:ZnO/ZnO structures are obtained by an ellipsometry technique in visible and near-infrared spectral range, and theoretical modeling is done using effective medium approximation. A method for analysis of spectroscopic ellipsometry data is demonstrated to extract the optical permittivity for our highly anisotropic nano-layered metamaterial. The results of the ellipsometry analysis show that Al:ZnO/ZnO structures with 1:9 ALD cycle ratio exhibit hyperbolic dispersion transition change near 1.5 µm wavelength which pushes more towards the optical region.

214 2:15 pm

*Factors Leading to Student Veteran Achievement in Postsecondary Education: Reexamining a Structural Equation Model Utilizing the Community College Survey of Men (CCSM)*

Thomas De La Garza, Education (D)
J. Luke Wood, Education

Military and veteran student achievement in community college has received increased attention this past decade with the surge in enrollment in postsecondary institutions by returning Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) veterans (Randall, 2012). Like their counterparts from prior eras, today’s student veterans frequently seek post-war educational opportunities at postsecondary institutions. While 43% of postsecondary student veterans are enrolled in community colleges (Radford, 2011), 84% begin their postsecondary education at two-year institutions (Kim & Cole, 2013). With the resulting rise of the student veteran population at community colleges, an increased demand to provide improved support is driving further examination into creating new, and enhancing existing, programs and services for military and veteran students. Prior research indicates student veterans share risk factors similar to other adult learners including full-time employment, part-time enrollment, delayed entry, and dependents (Wheeler, 2012), in addition to psychological feelings of isolation, disconnectedness, and discomfort in academic settings (Persky & Oliver, 2011). Student veterans also exhibit several positive traits conducive to achievement in academic programs such as being emotionally mature, focused, and experienced leaders resulting from responsibilities and leadership skills acquired during military service (Lighthall, 2012). This study endeavors to identify factors responsible for student veteran success to improve programs and services for this unique student population. The Community College Survey of Men (CCSM) assesses predictors of student success for historically underrepresented and underserved men in community colleges (Wood & Harris, 2013). While the instrument
was designed for community college men in general, a previous validation study also determined the CCSM’s utility as a needs assessment tool for veteran men (De La Garza, Wood & Harris, 2015). Analyses identified five constructs with strong factor loadings and internal consistency; they included action control, locus of control, degree utility, self-efficacy, and intrinsic interest. Building on previous CCSM validations, De La Garza’s Conceptual Model of Student Veteran Achievement (2015) was constructed and tested using a series of multivariate analyses to predict achievement. Further refinement of the structural equation model using intrinsic interest as the ultimate endogenous variable, provided a more accurate means to predict student veteran success.

Session C-5
Oral Presentation: Computational Methods in Aerospace & Mechanical Engineering
Friday, March 4, 2016, 1:00 pm
Location: Metztli

215  1:00 pm
Automated Finite Element Model Generation of Composite Bolted Joints Using Python Programming
Alexandra Mallory, Aerospace Engineering (U)
Satchi Venkataraman, Aerospace Engineering

Fiber-reinforced polymer composites are often used in lightweight aircraft structures, due to their high strength, stiffness and low density. Composite materials allow the fabrication of complex shapes without reduced part counts and fasteners. When constructing large structures, fasteners are required to connect parts (e.g. bolts and nuts). These connections become critical load transfer points between connected sub-structures. Their integrity and durability are important to the safety of aircraft structures. Bolted joint locations are particularly susceptible to stress and fatigue failure in composite structures due to increased stress concentrations around the edges of the bolt hole.

A detailed literature review of failure of bolted joints was performed to identify the significant geometry and physical parameter deviations that most affect the strength of a bolted joint. It was found that failure loads of bolted joints vary greatly as they are affected by variations in physical parameters such as fastener-hole geometry, bolt hole clearance, countersunk depth, and edge distance, bolt pretension, and contact friction. Previous researchers have investigated individual effects of above parameters. To date, there are no detailed studies that have investigated the interactions between these factors. The goal of this work is to develop a computational tool that can automate the generation of numerical finite element analysis models of composite bolted joints in ABAQUS™ software. A software tool that uses python programming and ABAQUS script commands was developed to automate the generation of geometry, finite element meshing, application of boundary support and loads. The developed software tool will enable parametric study of the effect of interactions between different uncertain physical and geometrical parameters on the failure load of composite bolted joints.

216  1:15 pm
Carbon Particle Tracking and Oxidation in a Small Particle Solar Receiver
Trent Martin, Mechanical Engineering (M)
Fletcher Miller, Engineering

Previous analysis for the Small Particle Heat Exchange Receiver (SPHER) has been done on carbon particles, but has been limited to cases where oxidation is not present due to the complexity of the oxidation process and the continual change of the optical properties that dramatically affect the radiation heat transfer in the receiver. In this study, the oxidation rate of the carbon particles in the receiver were calculated based on a given initial particle size, concentration, and temperature. The oxidation rates can then be used to determine the efficiency of the receiver, as well as how long it takes for the carbon particles to fully oxidize as they transit the receiver.

The receiver was modeled using ANSYS Fluent using a 3-D mesh with over 2 million control volumes (cells). Fluent was used to calculate the velocity and temperature at each cell, which was then passed to a UDF (User Defined Function) that was written for this research to track how the particles moved between cells. This was able to be combined with the temperature and particle size in each cell to determine the amount of oxidation through one of three oxidation models considered in this study. Many case studies were then performed by varying some of the initial properties, including the initial particle size and concentration, and the results for exit temperature, mean particle size at each location, and overall efficiency were determined. Results were compared for multiple particle concentrations and sizes to show the effect on the overall efficiency.
217  1:30 pm

**Finite Element Analysis of Countersunk Composite Bolted Joints in Double Lap Shear**

Manasi Palwankar, Aerospace Engineering (M)
Satchi Venkataraman, Aerospace Engineering

Bolted joints are often the choice for mechanical fastening in aircraft structures due to the ease of assembly/disassembly and inspection. However, bolted joints in composites introduce additional design challenges. The orthotropy of the laminates can lead to higher stress concentrations around the holes and can become a source of damage in the composite parts. The failure analysis of these joints in bearing loads is crucial as these aircrafts reach the end of their initially designed lifetime and the potential for extended use is evaluated. The ASTM D5961 Procedure-A (pin bearing in double shear) is commonly used to test bearing strength of composites. Countersunk composite bolted joints are widely preferred to straight hole joints in the aerospace industry due to their aerodynamic advantages. The bearing test procedure standard recommends the use of single lap joints for bearing tests on countersunk fastener heads. The ASTM D5961 Procedure-C is the suggested option to obtain bearing strength of countersunk composite bolted joints. Previous experimental investigations of composite bolted joints with countersunk fasteners have shown that the bolt and specimen bending and clearances of the bolt and bolt hole lead to changes in the out-of-plane pressure. Furthermore, the clamp-up loading contributes to uncertainty in the obtained bearing strength values. The procedure-C test results are also strongly dependent on the applied bolt torque or bolt preload. For thick composites where bending effects are negligible, using the standard ASTM D5961 Procedure-C single lap joint does not appear to represent reality. This paper investigates use of a modified fixture derived from the ASTM D5961 Procedure-C to accommodate a countersunk fastener in a double lap shear test. Numerical finite element analysis simulations of bolted composite joint tests with straight and countersunk holes using the original and modified fixtures are performed using ABAQUS software. The resulting deformations of the specimen and the pins, the inplane and out of plane stress distributions at the bearing location are compared.

218  1:45 pm

**Estimating Uncertainty Bounds for Blade Vibratory Stresses Under Multi-Mode Excitation**

AmudhaVarshini Kamaraj, Aerospace Engineering (M)
Satchi Venkataraman, Aerospace Engineering

The accurate prediction of peak vibration stresses of Integrally Bladed Rotors (IBRs) in their operating conditions is essential in engine survey testing. Stress estimation can be performed computationally by means of computer aided modeling and finite element analysis and blade vibration measurements. The advances in non-intrusive vibration measurement using blade tip timing data can help identify excited modes and the blade vibration in those modes and their relative phase. This paper presents the development of a software tool for automated analyses of the rotor geometry in ANSYS and post processing results to obtain the complex modal stresses. With the availability of modal stress real time updates of the maximum stress can be obtained using a superposition approach presented here. Estimating maximum stress requires a spatial and temporal search. The paper presents the effect uncertainty bounds of the maximum stress due to the uncertainties in the measured modal vibration amplitude and phase of the excited modes. These measurements errors are due to the limited number of sensors used in BTT measurements, small random variations in sensor sensitivity, sensor locations, and blade to blade variations.

219  2:00 pm

**Investigation of the influence of the subgrid-scale stress on non-intrusive spatial pressure measurement using direct numerical simulation turbulence database**

Seth Siddle-Mitchell, Aerospace Engineering (M)
Xiaofeng Liu, Aerospace Engineering

The instantaneous pressure distribution in a turbulent flow field can be measured non-intrusively by integrating the material acceleration measured using particle image velocimetry (PIV). However, due to the finite spatial resolution of the PIV measurement, the pressure reconstructed from PIV is actually subjected to the effect of spatial filtering. Consequently, the reconstructed pressure is effectively imbedded with the contribution of the sub-grid scale (SGS) stress, which is a term appearing in the filtered Navier-Stokes equation. To quantify the effect of the SGS stress on pressure measurements, we use box filtering to filter three dimensional velocity components in a time-varying isotropic turbulence flow field available to public.
from the John Hopkins University Turbulence Database (JHTDB), reconstruct the pressure based on the filtered velocity data and compare it to the filtered DNS pressure, thus gauging the error due to the measurement resolution effect. A 17×17×17 box filter as a first level filtering is used to bring the DNS data resolution down to the PIV resolution level. Then a 3×3×3 box filter is further applied to the already filtered velocity data so as to establish the modeled SGS stress based on similarity SGS stress modeling. Ensemble average of 512 instantaneous realizations of the DNS data indicates that inclusion of the modeled SGS stress term in the pressure reconstruction reduces the error from 6.99% when no SGS stress term was present, to 4.78%, indicating an advantage in using the SGS modeling in compensating the measurement error. In addition to the isotropic turbulence, the whole procedure is currently being tested with a DNS turbulent channel flow from JHUBD, which constitutes a harsher and more realistic testing case. Preliminary results show that an increase in overall error of the pressure reconstruction in the channel flow. However, by introducing the modeled SGS stress, the error was reduced from 11.96% to 9.04%, once again indicating an improvement using the SGS modeling for resolution error compensation.

220 2:15 pm

Macrodispersion induced by permeable surface topology

Bowen Ling, Mechanical Engineering (D)
Ilenia Battato, Mechanical Engineering

Permeable and porous coated surfaces are ubiquitous in natural and engineered systems and exhibit features that significantly deviate from their smooth impermeable counterparts. Even though flow and transport above such surfaces may be significantly affected by the surface topology, e.g. its porosity and permeability, the connection between the surface characteristics and their impact on macroscopic solute transport is still largely unknown. In this work, we focus on mass transport in a two-dimensional channel with permeable porous walls under fully developed laminar flow conditions. By means of perturbation theory and asymptotic analysis, we derive both the set of upscaled equations describing mass transport in the coupled channel-porous matrix system and an analytical expression relating the dispersion coefficient and the surface properties, namely porosity and permeability. Our analysis shows that the impact of surface coatings topology on macrodispersion strongly depends on the magnitude of Peclet number, i.e. on the interplay between diffusive and advective mass transport. The study provides a rigorous basis to relate matrix permeability to dispersion coefficient in coupled channel-matrix systems and gives quantitative guidelines for the design of porous/micro-patterned surfaces. The analysis also shows the possibility of controlling macrodispersion by either active (i.e. changing the operating conditions) or passive mechanisms (i.e. designing the pore geometry of the matrix) in the appropriate range of Peclet numbers. By elucidating the impact of matrix porosity and permeability on solute transport, our upscaled model lays the foundation for the improved understanding, control and design of microporous coatings with targeted macroscopic transport features. We validate our upscaled model by comparing concentration variation measured from experiments which performed on a series of microfluidic cells with different matrix geometries/permeabilities. Comparison shows a good agreement between our theoretical predictions and the experimental data.

Session C-6

Oral Presentation:
Political Theory, Opinion, & Identity
Friday, March 4, 2016, 1:00 pm
Location: Templo Mayo

221 1:00 pm

History as Political Theory: Thucydides, Machiavelli, and Trotsky

Genevieve Jones, Political Science (U)
Emanuele Saccarelli, Political Science

This research examines and compares three prominent and remarkable works of history: Thucydides’ The Peloponnesian War, Machiavelli’s History of Florence, and Leon Trotsky’s multi-volume History of the Russian Revolution. These works were authored by significant figures who played an active and leading role in the set of events they sought to document, and yet can by no means be dismissed as mere political propaganda or individual self-aggrandizement. In addition to narrating crucial historical events in a manner that has been both influential and the subject of scholarly controversies, these works constitute at the same time incisive works of political theory. That is, once properly interpreted, these historical accounts also address a series of crucial theoretical questions, including the problem of causality as well as objectivity in history; the relationship between social forces and political institutions; between the subjective intentions of political actors and the objective conditions in which they operate; between mass movements and political leadership, and more.

The project examines in a comparative vein these three texts from this particular standpoint. I argue that, in spite of the fact that they were written in three very distant periods of human history, different regions of the world, as well as in different economic,
social, and political conditions, certain crucial theoretical similarities can be identified across these three texts. Taken together, these books are outstanding exemplars of a distinctive and coherent mode of thinking about history and politics. Specifically, the histories written by Thucydides, Machiavelli, and Trotsky show that the difficult quest to attain historical objectivity can be realized on the basis of a definite theoretical framework, even in cases where the historians themselves were actively involved in the events they narrated.

222 1:15 pm
Kateyn Madar, Political Science (U)
Kimberley Fletcher, Political Science

The American people and the U.S. Supreme Court have a unique relationship compared to the other two branches of government. Previous studies find that Court decisions often align with public opinion in areas of social issues and minority rights. While the Court is not duty bound to align with public opinion, it often does, prompting scholars to develop more research to see if the Court takes public opinion into consideration when reaching decisions in controversial social issues. This paper therefore seeks to determine how public opinion is shaped and whether the Court considers public opinion in the area of same sex marriage. Using the same sex marriage movement as a case study I begin with an examination of the Court’s developmental narrative from when it first rejects the same-sex marriage issue in 1972 in Baker v. Nelson to the recent decision in Obergefell v. Hodges in 2015 to legalize it. I also evaluate the factors and ways in which public opinion is shaped and how the Court is in turn shaped by public opinion. In addition, this study examines the feedback loop of how the Court might influence public opinion. This study utilizes an analysis of doctrinal development, research on current events, and polling data. I find that it is unlikely that the Court considers public opinion in this area, but rather is influenced by the same social forces that shape public opinion. However, it appears that the Court’s progressiveness in cases relating to the rights of homosexuals has helped grow acceptance of homosexuals in America. In addition, I find that the media play a significant role as gatekeeper for information flow between the Court and the people. After the announcement of the Court’s decision in Obergefell v. Hodges (2015), this study finds that the media’s negative tone likely contributed to a drop in support for same-sex marriage reported by early polls.

223 1:30 pm
Islam on Homosexuality: Violent and Nonviolent?
Sierra Marcelius, International Security and Conflict Resolution (U)
Khaleel Mohammed, Religious Studies

Today, Islam and its teachings on different issues and whether they’re violent or nonviolent have come under scrutiny by almost everyone in the West. However, what is lacking in this scrutiny is objective, scholarly analysis of the variety of interpretations of Islamic teachings and their interactions with society over time and space. This research attempts to fill that gap in objective analysis in regards to what Islam teaches about homosexuality, specifically whether its teachings are violent, nonviolent or both. To do this, three research questions were investigated: 1) What are the differing perspectives within Islam on homosexuality and people who identify as homosexual? 2) How do these differing perspectives impact Muslims and non-Muslims (e.g. violently or nonviolently)? And 3) Is there a movement within the Muslim community to push for more tolerant views of people who identify as homosexual? These questions were researched using quantitative data such as statistics on the beliefs of Muslims in a given demographic and qualitative data such as analyses of Islamic texts and case studies of individual people or communities. It was found that although prevailing interpretations of Islam forbids homosexuality and homosexual acts, historically Islamic societies have employed the “don’t ask, don’t tell” policy to maintain harmony within their community. However, contemporarily, local organizing by Muslims who identify as homosexual and Western imperialism have challenged this tradition, which in many cases has led to increased homophobic violence. The research concludes that what Islam teaches about homosexuality is more nuanced than violent or nonviolent; rather Islam’s teachings regarding homosexuality can, have been and are interpreted to be both violent and nonviolent.
224  1:45 pm

Captives and their monsters: Examining the use of captivity narratives in the media construction of the Muslim as a monster.
Mary Stout, History (M)
Paula DeVos, History

Popular culture and mass media in the United States during times of crisis, anxiety, fear, and emasculated frustration have constructed and perpetuated the Muslim as the monstrous other in order to regain national masculinility, spur patriotic military action, and justify atrocities that would otherwise be outside the realm of morality and social norms. Monsters historically have been constructed to explain the unknown, the unexplainable, and the intolerable. They mirror societies’ greatest fears. Monsters have also been used as a warning to society, as an explanation for an unexplainable creature or human defect, or to incite violence against an enemy. In times of war, the adversary is often presented in the form of the monster to dehumanize the enemy. While this phenomenon has been exacerbated in the aftermath of 9/11, this tactic has existed since before the time of the Crusades. Using Jeffrey Cohen’s Monster Theory, as well as Michel Foucault’s theories on discourse, power, and knowledge and the critical theories of Edward Said, this presentation unveils the power of the media on multiple levels to incite public discourse and use the abject to create the enemy. This presentation particularly focuses on the use of the captivity narrative during the Iran Hostage Crisis and the “War on Terror” by television news, movies, books, and social media to illustrate how in times of emasculated national frustration against the Muslim adversary, U.S. popular culture and mass media has constructed the Muslim as a monster.

225  2:00 pm

Reluctant Fighters: Ordinary Soldiers in the Croatian Civil War
Andrej Radic, History (M)
Annika Frieberg, History

The Croatian War of Independence (March 1991–November 1995) was a four and a half year long conflict. A part of the Yugoslav wars, the Croatian War of Independence led to the formation of an independent Croatian republic as a result of socialist Yugoslavia’s disintegration. The war also saw the brief appearance of an independent Serb state, the Republic of Serbian Krajina, on the 30% of Croatian territory that had a significant Serb population. Historians and Social Scientists have written much about Yugoslavia’s disintegration, and the resulting wars in the 1990’s. Even today, scholars argue over the factors that caused the collapse of the Yugoslav state. I approach the situation from below, my method is to look at the statements of ordinary participants to see what they found significant. This paper uses a newly formed repository of in depth and rarely used archival interviews of common people to both take a deep look at the explanations for Yugoslavia’s disintegration given by the very soldiers who fought on both sides of the war in Croatia and to examine how differences including nationality, locale (rural/urban), political affiliation, and identity affected the interviewee’s outlook on the situation in Croatia and the former Yugoslavia.

226  2:15 pm

Neoliberalism in Higher Education: Social Stockholm Syndrome
Brandon Edwards-Schuth, Philosophy (M)
Steve Barbone, philosophy

Neoliberalism, a doctrine founded on economic Darwinism, demands deregulation (free markets), privatization of public services, and commodification. It is a methodology of extreme competition and egoism, where the measure of humanity is money. Stockholm Syndrome is a condition that originated from a bank robbery in which hostages grew a relationship of care toward their captor in light of a hostile situation of terror. Social Stockholm Syndrome is the expansion of Stockholm Syndrome to a larger group context in which a better understanding can be acquired by examining whole groups within a context of terror, e.g., women in abusive relationships, African-Americans reluctant to combat racism in the early south, etc.

Higher education has become increasingly under attack from neoliberalism as students must memorize and regurgitate facts for assessments that commodify students into objects, universities mirror corporate managerial structures and practices, and pedagogies become disconnected from the larger social context in order to focus on market-based skills in order to maintain the status quo. In essence, neoliberalism prevents higher education from becoming a force for a more just, equal, and democratic world. In this work I utilize criteria for having Social Stockholm Syndrome in order to better analyze the problems of a pedagogy of neoliberalism in higher education. I then provide alternative educational pedagogies that don’t perpetuate neoliberalism’s harmful hierarchical relationship, i.e., those of Paulo Freire, Anarchism, and Jiddu Krishnamurti.
Session C-7
Oral Presentation:
Books, Comics, & Digital Humanities
Friday, March 4, 2016, 1:00 pm
Location: Visionary Suite

227  1:00 pm
Sociodigital Coding: A Deep Dive into Digital Annotation
Theodore Bruni, English (U)
Jessica Pressman, English and Comparative Literature
Graham Rawle’s 2005 novel, *Woman's World*, is an aesthetically engaging experimental novel. With hundreds of 1960s magazine clippings, Graham pieces together a coherent and mysterious narrative about the life of Norma/Roy; two interchangeable characters that embody opposite gender identities. Initially, Rawle collaged the novel by writing a plot line and then physically gluing magazine cut outs on top of them to make a cohesive literary parallel. Undoubtedly, the making and form of this novel is representative of the medium in which it was written—that is—it is very much a print book based on the art scrapbooking. The end result is an avant-garde text, which challenges the traditional notion of the novel, but more importantly, it gives its readers an opportunity to join in on the experiment. And as I read *Woman's World*, the temptation to transpose the text into the medium of the digital was irresistible. Having already been inspired by the heteroglossic voices and social implications behind gender, my eyes began to see none other than color. And much like Rawle, I too, wanted the chance to experiment in terms of constraints, i.e. using tools to alter an existing text. To do this, I pinpointed a paragraph that was heavily laced with gender normative sentences; specifically, this meant looking for gender prescriptions and proscriptions. From there, the process of coding each line to identify its relation to gender stereotypes was implemented. The finished product was a colorful digital annotation of page 219–220.

228  1:15 pm
The Importance of Art in Today’s Wired World
Sean Tracy, Philosophy (U)
Mark Wheeler, Philosophy
Statement of Problem: There is no call for the progressive function of technology and the revelatory/expressive function of art to exist in opposition in the passage of human experience. Where science and technology may be characterized as developmental or progressive, the arts may be communicated in other terms; art in its nature may be characterized as revelatory or liminal. These positions have been and are currently in conflict, as the arts and humanities have been affected by societal shifts historically and presently. There is no call for these fields to exist as dualities, as they share in forms of activities: healing; discovering; informing; a great many others. Art plays an essential role in its transmutative potential and lending of perspective to the human experience. This is not at odds with the political, economic and otherwise societal progressions of present but rather a strengthening field that is intimately woven into the fabric of daily experience. Statement of Methods: Combine research from primary sources in the discussion of art, image, symbol, myth and education among other related fields. These disciplines include, but are not limited to: Philosophy; Psychology; Mythology; Neuroscience. Essential Results: Art lends irreplaceable portals into perspectives of the human experience. As science and technology continue to dominate the global community, it further disconnects from certain elements of the human experience. These disconnections are not explicit or conscious, necessarily, but perhaps implicit or unconscious. There is much integration that occurs in societal movement through time, and much that is lost. The history of humanity, and its vital role in education, cannot be told without the humanities. Art collects and carries history in unique and active processes that differ from those of other forms, namely depleted sensory engagements in electronics. Specific sensibilities aren’t necessary for experience to take place, but engagement with related content that explores such an experience can potentially heighten that interaction. It is an important role that art, and art in education, plays in the passing experience of life. Conclusion: The importance of art in education as expressed, explored, and experienced cross-disciplinarily.
ABSTRACTS
STUDENT RESEARCH SYMPOSIUM 2016
Student Level: (U)=Undergraduate; (M)=Masters; (D)=Doctoral

229  1:30 pm
Marginal Weavings and the Book as an Interface
Riley Wilson, English (U)
Jessica Pressman, English

My research examines the historical importance of marginalia while exploring the way in which marginal notes and glosses perform various functions and are similar to hyperlinks. By researching the various functions of marginalia—including uses as academic annotations, historical accounts of certain readings, personal narratives, a symbol of sentence and “phenomenality,” and hypertext—it is clear that these seemingly-frivolous notes have consequences and meaning. Furthermore, examining the nature and value of marginalia is akin to examining the purpose and value of books as objects and media.

Marginalia has a rich backstory, despite the fact that it has remained rather static in appearance over the centuries. This unchanging presentation endures even in digital media in the forms of digital footnotes and hyperlinks, allowing marginalia to be considered an analog form of hypertext.

By examining the value that is placed on marginalia, both historical and otherwise, it is clear that the book is not simply an object to be consumed, but one that encourages a conversation and interaction between a reader and the book. This concept is demonstrated in a corresponding art piece, wherein I embroidered various marginalia into a copy of East of Eden. Through the fifty-one separate threads running through the book, a multi-colored, shifting dialogue is established between “reader” and object. The practice of writing in books is deeply woven into our history as readers, and the remediation of the page into a web page or digital document is also represented in the embroidered book.

230  1:45 pm
The Digital Humanities and Literature
Allison Tester, English (U)
Jessica Pressman, English and Comparative Literature

Graham Rawle’s novel Women’s World is made entirely of cut out words from women’s lifestyle magazines from the 1960’s. The words are literally pasted onto the pages of the novel to tell the story of gender identity through characters Roy and Norma, who we find are actually the same person. Because the words are in various fonts, sizes, and colors, I wanted to employ a digital tool to help me interpret the text differently, and to look at meaning instead of aesthetics. Specifically, I wanted to look at the differences in diction choices to show the ways gender was portrayed in the character’s two most pivotal moments.

I typed two different chapters; one based on Norma in a scene of attempted rape, and the other of Roy as a victim of sexual aggression, and I then compared them using a word cloud generator. The word cloud generator displayed the words size based on how often they were used and then I color coded the words for numerical value.

The findings showed the ten words most used in Norma’s chapter were: my, he, you, his, me, hands, hand, there, him and don’t. The ten words most used in Roy’s chapter were: he, his, Roy, they, them, you, not, up, no and suitcase.

In my talk, I will explain how these findings, via the word cloud generator helped lead me to see the novel differently and to draw interpretative conclusions about it. Specifically, I will discuss how the lists seem relatively similar in their strong emphasis on masculine pronouns and negative responses, but this does not mean that gender is being portrayed similarly in these chapters. The variations are also important, and one of the most curious differences is the use of negative commands.

Ultimately the digital tool I used allowed me to take a novel that’s all about word choice and actually see the effect of diction choice in the portrayal of gender. This project also demonstrated how digital humanities practices of using digital tools to assist in reading text can lead a reader and research to different conclusions and interpretations.

231  2:00 pm
The Politics of ‘Representation’ In Underground Queer Comcis
Angela Risi, English/ Psychology (U)
Yetta Howard, English & Comparative Literature

Interviews with and statements of purpose from prominent contemporary queer comic artists indicate the desire to produce relatable, positive, and empowering representations of queer identities as the common thread amongst their artistic motivations. During the 1990s, certain LGBT activist groups similarly advocated and called for positive media representation; however, some underground queer comic artists, such as Roberta Gregory and Diane DiMassa, met this sentiment with resistance. These comics suggest that the idea of relatability or other such positive representations imply conformity or assimilation, invalidating one’s queerness and unique experiences, and, consequently, discouraging the agency of marginal LGBTQ voices.

The research at hand aims to explore the politics of queer representation in relation to the underground, with a critical examination of historical context. In other words, a consideration of the changing status of LGBTQ social and political positions and attitudes informs the analysis of the evaluated works. This project entails a comparative analysis of underground queer comics from the 1990s and present day, in particular, Diane DiMassa’s indie publication Hothead Paisan: Homicidal Lesbian Terrorist and Tab Kimpton’s webcomic Khaos Komix. Attention to aesthetic
technique will be emphasized, prompting navigational questions such as, “What does queerness in comics and the underground look like, and how does this influence and be influenced by larger, mainstream queer culture?”

232  2:15 pm  
**Literature Speaks: A Conversation about the Books that Matter to Us**  
Elizabeth Allison, English Literature (M)  
Joseph Thomas, English and Comparative Literature  

Literature Speaks is a project endeavoring to move conversations about books into the wider, non-academic community. Organized literary scholarship is responsible for introducing students of literature at every level to the traditional literary canon, but the danger of teaching according to such an exclusive list is the potential for privileging a non-diverse, biased collection of books as a single image of acceptable or successful literature.

In my research, I asked participants which books they had enjoyed, which books have had a profound impact on their lives, and which books they believed to be important literature. Though many casual readers are having meaningful, transformative experiences with books, the act of reading often becomes a measurement of social relation, where one’s status is determined by the presumed scholarly labor required to read a certain book.

In the analysis of the conducted interviews, I apply the research of Amy Blair, Pierre Bayard and David Richter to determine if a reader reads for pleasure, instead of reading for academic or philosophic growth, their social currency of perceived discernible intellectual labor is diminished.

An apprehension over one’s own level of literary expertise discouraged readers from wanting to participate in a conversation about books with me. By including genres traditionally considered to be less academically challenging, such as children’s literature, or popular fiction, into the canon, reading becomes accessible to a greater audience. Such access to new ideas and social perspectives has the power to provide a reader with a sense of community and potentially shift a culture’s ideology.

Literature Speaks moves the conversation out of the classroom in order to encourage intellectual dialogue beyond the walls of academic institutions. The transformation of scholarly discussions into social discussions contributes to the empowerment of casual readers to think critically about what they have read and experienced. My research with Literature Speaks directly invites the community to participate in the conversation, giving the casual reader a voice and the permission to speak freely about which books that matter to them, and why.

Session C-8  
**Oral Presentation:**  
Communication, Learning & Health  
Friday, March 4, 2016, 1:00 pm  
Location: Legacy Suite

233  1:00 pm  
**An Electrophysiological Study of Initial American Sign Language Acquisition in Adult Learners**  
Megan Mott, Psychology (U)  
Phillip Holcomb, Psychology  

Previous research on second-language learning indicates changes in event-related potentials (ERPs) to L2 words, most notably an increase in amplitude of the N400 as learning occurs. The present study examined the earliest stages of learning American Sign Language (ASL), a visually dynamic language with no written form. ERPs were recorded from 32 scalp sites in college-age English-speaking monolinguals with no prior knowledge of ASL as they watched short individual video clips of a native signer producing 160 ASL signs. In a laboratory setting, participants then learned the English translations of 80 of the 160 signs via a series of associative learning protocols. Each of the learned English/ASL pairs was presented a total of five times during the learning protocols, and participants were instructed to avoid ASL outside of the lab in between experimental sessions. Post learning, ERPs were recorded as participants watched all 160 ASL clips (learned and unlearned), performing a go/no-go semantic categorization task. Pre-learning, there were no ERP differences between the 80 signs that were in the to-be-learned group and the 80 signs in the unlearned group. However, post-learning there were clear ERP differences between learned and unlearned signs, with increased negativity for the learned signs. These effects were similar in polarity and latency to those seen in previous studies of spoken and written language learning. Overall, these results suggest that comparable mechanisms underlie the formation of lexico-semantic representations for signed and spoken language learning.

234  1:15 pm  
**Cancer Fatalism in the Deaf Community**  
Dena Kaufman, Psychology (U)  
Vanessa Malcarne, Psychology  

BACKGROUND: Approximately 20 million Americans suffer from some kind of hearing loss. However, studies have shown that the Deaf community is medically underserved. This may be attributed
to a number of factors, and research suggests that communication barriers, differences in culture, and the community’s unified mistrust in medical institutions play a major role. Consequently, the Deaf community is more likely to have fatalistic views towards chronic illness, such as cancer. Cancer-related fatalism and a negative attitude toward the possibility of preventing or recovering from disease can negatively impact motivation for prevention and adherence to treatment. METHODS: One hundred thirty Deaf Americans, 21 and older, were recruited through a variety of means, including word of mouth and social marketing. After giving informed consent, they completed surveys administered in American Sign Language. The current study focuses on two specific measures from the survey: Multidimensional Health Locus of Control (MHLC) Scales and Powe Fatalism Inventory (PFI). The MHLC Scales measure four ways one attributes responsibility to recovery from an illness: internal control, powerful others control, chance control, and God-related control. Scores can range from 6–36; higher scores indicate a stronger belief in that particular type of control. The PFI measures cancer-related fatalism, meaning the individual perceives that death is inevitable once cancer is diagnosed. The measure consists of fifteen yes or no questions. Higher scores indicate greater levels of fatalism. The questions focus on four aspects of cancer fatalism; fear, pessimism, predetermination, and the inevitability of death. RESULTS/FINDINGS: Analysis of variance will be used to test the hypothesis that Deaf individuals will have higher degrees of cancer fatalism than non-Deaf individuals. Correlational analysis will test the hypotheses that high levels of cancer fatalism will be associated with low levels of internal control over one’s health, low levels of powerful others’ control over one’s health, high levels of chance control over one’s health, and low levels of God-related control over one’s health. CONCLUSION: This study will contribute to our understanding of cancer-related fatalism and health-related locus of control among Deaf Americans.

235 1:30 pm

HPV vaccine sentiment among Twitter users: An assessment of inter-rater reliability

Marcus Lewis, Psychology (U)  
Eric Buhi, Public Health  

Human Papillomavirus (HPV) is the most common sexually transmitted infection (STI), and is the leading cause for cervical, throat, and genital cancers (CDC, 2015). Vaccines developed for HPV could prevent up to 90% of anal, cervical, vaginal and vulvar cancers (FDA, 2014) but have been met with controversy. Social media represents a potential vehicle for the promotion of HPV vaccines, given that adolescents and young adults who are within the indicated age-range for receiving the HPV vaccine are heavy users of social media (The Nielsen Company, 2014). However, no tool has been identified that can be used to extract HPV vaccine sentiment data on social media sites, such as Twitter. This study aims to assess an extraction tool for evaluating sentiment of tweets about the HPV vaccine. We purchased data (tweets) directly from Twitter that were posted by Twitter users between December 2014 and February 2015. Four sets of keywords (HPV and vaccine; Gardasil; Cervarix; [vulvar OR vaginal OR cervical OR anal] cancer and vaccine; and [genital warts] vaccine) were used to search all tweets posted internationally. Retweets and tweets posted in a non-English language were excluded. We used a codebook to independently and manually code 1000 tweets that were randomly selected from the original set of tweets. The tweets were analyzed for negative, neutral, positive, and ambiguous sentiment. Tweets coded for negative sentiment may have included keywords “sore”, “hurts”, and “death”. Usually, neutral sentiment was coded because the tweet’s content was not related to vaccine uptake. Most sentiment disagreements were related to comprehension of the tweet’s content, thus inaccurately assessing the sentiment. Inter-rater reliability (IRR) was calculated for 100 tweets coded, the average IRR between all coders was 97.7% on all categories. From three coded reviews the average inter-rater reliability was 74.04% agreement on assessing sentiment, meaning that the average IRR for assessing tone between the coders can be considered acceptable and the overall IRR is almost perfect. This extraction tool can potentially help health officials improve current strategies for HPV vaccination efforts by helping researchers to assess real-time discourse and public sentiment surrounding the HPV vaccine.

236 1:45 pm

Cell Phone Anxiety and Test Performance

Jocelyn Wilsey, Psychology (U)  
Katherine Turner, Psychology  

It is no surprise that when isolated from the online world, levels of anxiety become increasingly high among the general population. Removing oneself from this world can cause disquietude that manifests itself in ways that are uncomfortable to most. At what point then, does this feeling of unease begin to create problems with a greater effect on functioning? It was hypothesized that the feelings of anxiety that arise from removing oneself from their cell phone would have a negative impact on participants’ ability to quickly and efficiently complete a general problem solving task. Participants were recruited from Psychology classes at San Diego State University and asked to complete a test in 30 minutes. The testing packet included either a neutral or anxiety provoking vignette, a copy of the State-Trait Anxiety Inventory (STAI), a copy of the Test of General Reasoning Ability Blue Form (TOGRA), and a demographics section. There was a significant correlation found between participants’ trait anxiety levels and TOGRA scores.
Similarly, there was a significant correlation between the overall scores on the state anxiety inventory and those participants who reported that they commute to school. Sample sizes and power are discussed. This research is important in understanding the pressure placed on students when taking a test and could prove crucial in future research on how to better manage and prevent test anxiety.

237  2:00 pm

A Theoretical Model of the Communicative Construction of Play
Hayden Harrower, Communication (M)
Brian Spitzberg, School of Communication

This theoretical model examines the communicative nature of play; how it begins, how it is constructed, how it is maintained, and the ultimate benefits that come from it. Research on play examines the need for play in the lives of healthy human development (Brown, 2009). Through the conceptualization of others (Bateson, 1955; Caillois, 2001; Huizinga, 1949), play can be articulated as a communicative interaction. By understanding how it is play forms communicatively, this research could not only identify and categorize context in which play is constructed and when it is not, but it can also empower people in any given context to make their situations more playful, so that there is a higher level of affect, the interactions are more fun, and more joy and relational satisfaction is produced mindfully.

Session D: Oral Presentations

Session D-1

Oral Presentation:
Cell Biology, Microbiology & Virology
Friday, March 4, 2016, 3:00 pm
Location: Pride Suite

238  3:00 pm

Verifying the Genotypes of Mice Susceptible to Colorectal Cancer
Mario Tavakoli, Biology (U)
Kathleen McGuire, Biology

Colorectal cancer (CRC) is the second most common cause of cancer death in men and women combined, prompting global efforts to explore the causes of CRC. The majority of CRC cases in humans are sporadic, implying they are caused by a genetic mutation in an individual rather than being inherited. One syndrome, known as Familial adenomatous polyposis (FAP), is caused by a genetic mutation in the Adenomatous polyposis coli (APC) gene. Humans with this condition have a nearly 100 percent chance of developing numerous polyps in their colons by age 40. Mice have become the model of choice for studying CRC, as they possess complex host-microbiota interactions that are analogous to those of humans.

Genetic disruption of one allele of APC in the mouse genome, similar to human FAP, resulted in numerous polyps in the small bowel. In humans, however, the deletion induces colon, i.e. large bowel, tumors. To increase the specificity of the deletion in mice, scientists inserted a LoxP-flanked chromosomal APC gene to create the C57BL/6Apc<sup>tm1Tyj</sup>/J mouse strain. A separate mouse strain, called TS4-Cre, was made to express the Cre recombinase specifically in the colon. The crossbreeding of these parents conceived a heterozygous TS4-Cre/Apc<sup>tm1Tyj</sup>/J strain that displays Cre-mediated recombination to delete one copy of the APC gene specifically in the mouse colon. This deletion promotes the growth of colonic polyps and 100% of the mice should get CRC.

Although the crossbred heterozygous mice used in this study were expected to develop CRC, only 7 of 42 produced tumors. Two different possible explanations exist: 1) the parental mouse strains were not homozygous, and thus not all the cross-bred mice had the appropriate genes, or 2) there is an unexpected phenotype in this cross-breeding. Consequently, my task was to determine the genotypes of the 6Apc<sup>tm1Tyj</sup>/J and heterozygous TS4-Cre/Apc<sup>tm1Tyj</sup>/J mice used in this study. The presence of both the Cre and floxed APC alleles were confirmed in all mice using polymerase chain reactions and agarose gel electrophoreses. Therefore, we were able to conclude that the study contained an unexpected phenotype.

239  3:15 pm

In vivo Induction of ectopic organ
Isaac Marquez, Biochemistry (U)
Jeffrey Gustafson, Chemistry

Many diseases are associated with organ failure, including pancreatitis, cirrhosis of the liver, glomerular disease, coronary artery disease and pulmonary fibrosis. The need for organ replacement and the problems associated with it are a great burden on patients waiting for transplants. Problems associated with organ transplant are immune rejection, the durability of the donor organ, and the limited amount of cadaveric donors. An alternative approach includes the use of transplanted stem cells with the potential to heal and regenerate the damaged tissue, but the use of stem cells comes with the risk of cancer. A more radical, novel approach would be to grow ectopic vital organs in the patient’s own body. Our lab is testing the feasibility
of this approach using the model organism zebrafish, and our current goal is to grow a pancreas adjacent to its normal context. To achieve this, candidate genes are tested to reprogram non-pancreatic intestinal cells into pancreatic cells in vivo. We are currently generating genetic constructs containing the pancreatic “master regulatory” factors to induce the pancreatic program. Transgenic lines with these constructs will allow us to control when and where these factors are expressed. (Specifically, the gene will be under the control of a “heatshock” promoter and so will only be expressed when the fish are incubated at higher temperatures. A Cre-lox binary system will be used to control the tissue specificity of gene expression). Once a stable transgenic line is established, conditions will be optimized and the efficiency of the construct will be analyzed. Future studies include determining if the candidate genes are sufficient to induce pancreatic tissue and to assess the function of the new organ.

240 3:30 pm
Consequences of telomere dysfunction of intestinal crypt stem cells
Dustin Burkman, Biology (U)
Ralph Feuer, Biology

The end of linear chromosomes are composed of repetitive [TTAGGG] sequences, referred to as telomeres, and represent the binding site of a 6-member protein complex termed Shelterin that is essential to protect chromosome ends. Mutations in the shelterin complex have been shown to lead to genome fragility, non-homologous end joining of chromosomes and telomere dysfunction, which is known to be key in many early stage cancer prognosis. It is known that mutations in the intestinal crypt tissue-specific stem cell positive for surface marker LG5 lead to progression of intestinal cancer. Our research shows the consequences of telomere dysfunction on the viability of intestinal stem cells by demonstrating how the deletion of specific telomere binding proteins affects cells of the intestine and possible tumor formation, specifically of colorectal intestinal cancer. In addition, we explore whether telomere dysfunction combined with defects in the DNA damage response pathway can promote tumor initiation and progression. Transgenic mice with an inducible Cre-ER system were used to delete the shelterin components POT1 and TRF2 in vivo. Deletion of POT1 and TRF2 lead to acute telomere dysfunction allowing us to test whether intestinal stem cells undergo a canonical DNA damage response, senescence and/or apoptosis in vivo. We then evaluated whether telomere dysfunction initiated in intestinal stem cells contributed to colorectal tumor formation. Immunohistochemistry, in situ Hybridization, Immunofluorescence, RT-qPCR, Atrophy Quantification, Senescence β-Galactosidase Staining and FISH Chromosome Metaphase Spreads were used to experimentally test our hypothesis. This research aims to gain a better understanding of how LGR5 intestinal crypt tissue-specific stem cells respond DNA damage.

241 3:45 pm
Elucidating Protein Interactions between Hepatitis C Virus Capsid Protein and the COP9 Signalosome
Julia Weisbrod, Molecular and Cell Biology (M)
Roland Wolokowicz, Biology

Hepatitis C Virus (HCV) is a major cause of liver diseases that include liver fibrosis, cirrhosis and hepatocellular carcinoma. Currently it is estimated that 130–170 million people in the world are infected with HCV. In order to better understand a disease that affects so many worldwide, we intend to elucidate novel interactions of HCV with the host. Understanding the specific interactions a virus has on host proteins can lead to the discovery of novel therapeutics for HCV. Previous literature has been published that show interactions between viral proteins and subunits of the COP9 signalosome in the host. The COP9 signalosome is a highly conserved eight subunit protein complex that is involved in a wide range of functions within the cell, but very little has been done to study the effects that viral infection has on its functions. We hypothesize that the capsid protein of HCV, core, interacts with the COP9 complex in the nucleus of the cell. In order to investigate our hypothesis, an immunoprecipitation system was implemented to directly investigate core protein binding partners. Stably expressed mammalian cell lines were developed to express core fused to Streptavidin Binding Peptide. This allows the use of streptavidin-coated magnetic beads to immunoprecipitate core via the Streptavidin Binding Peptide. After the cell lines were established, fractionation was performed to separate cytosolic, membranous/organelles, and nuclear proteins. Once isolated, the nuclear fraction, core was immunoprecipitated with magnetic beads and analyzed via Western blot to detect the subunits of the COP9 signalosome. Based on Western blot analysis, COP9 Signalosome subunit 5 (CSN5) was pulled down with core. This suggests the core protein of HCV can interact with a subunit of the COP9 signalosome in the nucleus.
242  4:00 pm  
**Dietary Antimicrobials and Prophage Inducers—Towards Landscaping of the Human Gut Microbiome**

Lance Boling, Cell and Molecular Biology (M)  
Forest Rohwer, Biology

The human gastrointestinal tract is one of the most densely populated ecosystems on Earth, with a concentration of $10^{13} - 10^{14}$ bacterial cells per gram of fecal matter in the large intestine. They may be commensal, symbiotic, or pathogenic in relation to the host and are distributed nearly equally into two major phyla – the Bacteroides and the Firmicutes. These bacteria and their associated phage contribute immensely to human health and disease states. Obesity, diabetes, Crohn’s disease, metabolism, immunity, and even mood are associated with specific microbiota. Changes in community composition away from steady state can lead to dysbiosis and disease. Temperate prophage integrated into bacterial genomes propagate by duplicating their genetic material whenever their host does, until specific signals induce the lysogen to form phage particles and lyse the host cell. Foods and chemicals consumed by humans are likely to trigger these signals, thereby modulating gut community compositions and human physiology. Here I examine the effects of over 130 commonly consumed chemical additives, foods, and plant extracts on the growth and prophage induction capacity of bacterial species representing the two major phyla of the gut. This examination is preceded by the development of two novel experimental techniques – one to mass-analyze bacterial growth curves, and another to quantify induced prophage with flow cytometry. These studies showed that the tested compounds differentially affect bacterial growth, and likely human gut community composition. Several new prophage inducing agents were also identified – including Stevia rebaudiana and bee propolis extracts. These methods and results present novel tools toward the eventual manipulation of the human gut microbiome.

243  4:15 pm  
**The Role of Astrocytes During Bacterial Central Nervous System Infection**

Thomas Weston, Biology (M)  
Kelly Doran, Biology

The blood-brain barrier (BBB) is primarily composed of a layer of specialized brain microvascular endothelial cells (BMEC), and together with astrocytes, pericytes, neurons and the extracellular matrix, constitute the neurovascular unit (NVU). The BBB functions to protect the brain from toxins and microbes that may be present in the blood by maintaining specialized intracellular tight junctions and strict regulation of endocytosis. Astrocytes surround BMECs and the entire vasculature of the brain with their pseudopodia. Astrocytes have previously been shown to help maintain BBB function and are thought to help prevent microbial infection of the CNS (meningitis). However, little is known about the interaction and response of astrocytes to bacterial infection. We hypothesize that astrocytes play a unique role during bacterial infection and the development of meningitis. Here we examine the interaction and response of astrocytes to the leading neonatal meningial pathogen, Group B Streptococcus (GBS). We used an astrocyte cell line, SVGA, to characterize GBS infection in vitro. We found that all clinically dominant serotypes of GBS that we tested (Ia, Ib, III, and V) were able to adhere to and invade astrocytes. Furthermore, we observed that wild-type GBS was able to persist within an intracellular compartment for at least 12 hr following invasion. We then examined the response of astrocytes to GBS infection by RT-qPCR and found that infection resulted in the induction of several pro-inflammatory factors such as interleukin (IL)-1β, IL-6, IL-8, and IL-36 as well as factors that promote BBB breakdown such as VEGF, MMP-2, and MMP-9. Additionally, we found that internalization of GBS is not necessary to induce a pro-inflammatory response. Most recently, we have shown that GBS can interact with astrocytes in vivo. Gaining a better understanding of astrocyte response during bacterial infection will provide new insight into BBB function and disruption during the development of neonatal meningitis. Future work will focus on determining the impact of astrocyte-derived factors on BBB function using an in vitro co-culture model with BMEC.

244  4:30 pm  
**Viral Genome Packaging in T4-like bacteriophages**

Sean Benler, Biology (D)  
Forest Rohwer, Biology

*Vibrio coralliilyticus* is an emerging bacterial pathogen that infects the mucosal surface of corals and has been implicated in bleaching events worldwide. Phage therapy has been suggested as a potential strategy to combat *V. coralliilyticus* infections across coral reefs. Here we report the complete genome of a lytic bacteriophage, named YC, whose host range is specific to *V. coralliilyticus*. Phage YC is a member of the T4-like family based on high sequence homology and morphological similarity to bacteriophage T4. Bioinformatic analysis of YC phage genome revealed that gene gp4, which encodes for the phage head maturation protein and is highly conserved across T4-like phages, contained a conserved nuclease domain. This domain is found on transposon Tn7, and cleaves DNA as part of the transposase holoenzyme. To confirm the predicted nuclease capability of gp4, the protein was cloned and expressed in *E. coli* bacterial host and assayed biochemically. Indeed gp4 was shown to degrade plasmid DNA in vitro. These experiments suggest that gp4, which
is associated with joining mature phage capsids to tails, exerts its effect by cleaving DNA during viral morphogenesis. Greater understanding of how T₇-like phages are assembled will augment phage engineering and synthesis and improve efficacy of phage therapy treatments.

Session D-2
Oral Presentation: Marine Biology
Friday, March 4, 2016, 3:00 pm
Location: Park Boulevard

245  3:00 pm
Impacts of Rainfall Alteration and Invasive Plant Species on Soil Structure in Coastal Sage Ecosystems
Risha Al Sawad, Microbiology (U)
David Lipson, Biology

The effects of invasive species in relation to climate change have been extensively studied in aboveground ecosystem processes, however these studies ignore their impacts below-ground largely due to the complexity of soil organic matter (OM). OM has positive impacts on soil fertility, including increases in biological activity, and aggregate stability. Soil plays a major role in global carbon cycling because it acts as a reservoir that stores up to 2400 gigatons of carbon. Any disturbance affecting soil structure will affect the amount of carbon that gets stored into the soil. Coastal sage scrub is a Mediterranean-type ecosystem, dominated by scrubs, spanning the Pacific coast from northern San Francisco Bay to Baja California. This ecosystem is highly threatened and subjected to several disturbances including invasion by exotic annuals. I hypothesize that due to soil physical, chemical, and microbial differences between native and invasive plant growth, there will be differences in their soil structure, specifically aggregate structure, and organic matter content. Methods: rainfall manipulation experiments were conducted in Santa Margarita Ecological Reserve. It consisted of two vegetation types [Mature native shrubs vs. exotic annuals], and three water treatments [50%,100%, and 150% of ambient rainfall] maintained since 2012. Soil was fractionated into various size classes of aggregates, particulate organic matter, and residual soil that was not aggregated. The carbon associated with each of the fractions was measured. Results: Preliminary results show more aggregates in the native species. It was particularly significant for the [0.5-2 mm] size fraction. No significant differences in the rain treatments were detected. Conclusion: Reduction in soil structure is associated with invasive plants because they are annuals that leave the plots empty for parts of the year. These soils are subjected to more erosion and disturbances compared to native shrubs. Carbon associated with aggregates is expected to be more stable and stay in the system permanently, implying that invasion is associated with a reduction in carbon stability. It is possible that previous disturbances in the ecosystem lead to the destruction of these aggregates and the establishment of invasive species. Future studies are needed to investigate these mediated effects.

246  3:15 pm
Cross-species microsatellite markers: Tools to investigate mating systems of puff adders (Bitis arietans)
Eliana Moustakas, Biology (U)
Rulon Clark, Biology

Little is known about the mating system of South African puff adders (Bitis arietans). Historically, field observations were the only way to learn about mating and reproduction. Now, using genetic information, individuals and their relationships to others can be identified with accuracy and high resolution. This study uses microsatellite loci to learn about puff adder parentage, kinship, and reproductive success. However, microsatellites have not been developed specifically for Bitis arietans. I tested published microsatellites for species throughout Viperidae. Both Crotalus and Vipera had species that provided informative, polymorphic markers for Bitis. Cross-species microsatellite markers can be used to determine kinship within puff adder populations. Genotyping and kinship assignments are ongoing for the dataset of more than 500 puff adder individuals.

In junction with Dr. Xavier Glaudas's ecological field work in South Africa, a complete population and landscape structure will ultimately be developed. Understanding puff adders mating systems is useful for management applications and ecosystem services. Puff adders are both predator and prey in the dynamic South African food web. Our work will supplement a gap in current ecological knowledge, allowing for even more informed decision-making and conservation efforts.

247  3:30 pm
Effects of Pollution on the Shore of El Naranjo Sea Turtle Nesting Beach, Nayarit, Mexico
Jeremy Zaida, Biology (U)
Katherine Comer-Santos, Biology

This study sought to characterize and quantify the amounts and types of pollution that were present in three distinct land use zones (developed, future development/forest, estuary) on the El Naranjo sea turtle nesting beach in Nayarit, Mexico. We performed two different types of studies to do this. The first was a NOAA Marine Debris 5-week standing stock survey, the second was a NOAA accumulation study done during the final
week. Across the three zones surveyed, we found that plastic-type pollution between the sizes of 2.5 and 30 cm in length was the most commonly encountered category (91% of total). We also conclude that undeveloped beach zones that undergo regular cleaning operations have significantly reduced amounts of contamination per square meter (ANOVA, p=0.0026). This study provided a baseline quantification of pollution density that can be compared to future levels. Future pollution may change due to construction and development of a major Costa Capomo resort taking place on this beach over the next two years.

249 3:45 pm  
**Landscape genetics of the San Diego Fairy Shrimp (Branchinecta sandiegonensis)**  
Natalie Goddard, Biology (M)  
Andrew Bohonak, Biology  
The San Diego fairy shrimp (*Branchinecta sandiegonensis*) is listed as federally endangered as a result of large-scale urbanization and subsequent vernal pool habitat loss. When new pools are created for mitigation or disturbed pools are restored, sediment from existing pools may be used for inoculation. The success of these projects can depend on whether source material is taken from a gene pool that is differentially adapted from the destination. Previous studies have suggested that there are at least two relatively differentiated gene pools of San Diego fairy shrimp within San Diego County. A putative contact zone between these gene pools occurs primarily on land owned by the Marine Corps Air Station at Miramar (MCAS Miramar). Using the mitochondrial gene COI in conjunction with seven microsatellite loci, we have delineated the relatively abrupt gene pool boundary with greater precision than was previously known. We have also tested for additional population structure within each of these regional gene pools, based on a variety of pool-specific and landscape features. A greater understanding of the processes underlying genetic population structure in endangered species such as the San Diego fairy shrimp can lead to more effective management and conservation decisions.

250 4:15 pm  
**Coral Reef Geometry Wars: Using coral geometry to understand coral-algal interactions**  
Emma George, Cell and Molecular Biology (M)  
Forest Rohwer, Biology  
Corals must defend their perimeters against algae and other benthic organisms. We hypothesized that resources available to defend a coral’s perimeter or attack a competitor depends on the surface area of a colony available for nutrient uptake and photosynthesis. To test this hypothesis, two variable chain-link methods were used to measure the perimeter of six coral colonies from the Caribbean island of Curacao. Surface area was calculated using a 3D, overlapping photo method. These values were used to calculate the perimeter to surface area ratio. Visual scoring was then used to determine the percentage of coral perimeter losing to another benthic organisms (i.e. algae overgrowing coral tissue). The perimeter to surface area ratio...
positively correlated with the percentage of perimeter along which the coral was losing a competitive interaction, suggesting that a large perimeter area is energetically expensive and may allow algal overgrowth. Coral geometry serves as a visual representation of all factors impacting a coral colony and may have implications in understanding coral-algal interactions.

251  4:30 pm
*Cascading Non-consumptive Effects of Predatory Fish Drive Habitat Loss in the Kelp Forest*
Miranda Brett, Biology (M)
Todd W. Anderson, Biology

Predator-prey interactions consist of both consumptive effects, direct removal of prey, and non-consumptive effects, prey’s response to threat of predation which commonly alters prey’s behavior, morphology or physiology. Both consumptive and non-consumptive effects can have cascading impacts on ecosystem structure. We are investigating the relative importance of consumptive and non-consumptive effects in a tri-trophic interaction of a temperate reef-associated fish, *Oxyjulis californica*, on a grazing limpet, *Lottia insessa*, with cascading effects on a habitat-forming kelp, *Egregia menziesii*. In laboratory mesocosms, consumptive and non-consumptive effects were demonstrated with treatments allowing and restricting fish access to limpets. Limpets modify their behavior in the presence of fish by decreasing grazing and movement. Changes in limpet behavior directly benefit the kelp by increasing the breaking strength of fronds. Additionally, the relative importance of these effects were assessed through simulating predation without the presence of fish, by culling limpets at a predetermined rate. We found that the non-consumptive effects comprised on average 81% of the total predator effect. Through caging experiments in the field, we are currently testing the ecological realism of these interactions found in the lab. Treatments restricting *Egregia* and associated limpets from outside predation, have significantly more grazing scars and weakened algal strength compared to open treatments with ambient predation, as well as treatments containing fish both consumptive and non-consumptive. This research addresses a large gap in the literature on the pervasiveness of non-consumptive effects in natural habitats, elucidating the importance of the presence of fish predators on habitat structure in the subtidal marine environment.

Session D-3
**Oral Presentation:** Oral Health
Friday, March 4, 2016, 3:00 pm
Location: Tehuanco

252  3:00 pm
*Parent-Assisted Oral Care: Results from an Empirical Analysis*
Andrew Jen, Marketing (U)
Martina Musteen, Management

Tooth decay is more prevalent than cases of asthma, obesity, or diabetes—thus making it the leading chronic childhood disease. Furthermore, early childhood caries, or cavities (ECC), are indicative of future oral problems. In the oral health community, it is widely agreed upon that ECC can be mitigated by taking preventative measures at a young age. One of these methods is carried out through the establishment of a routine. During these times, a caretaker assists in providing oral care until a child can do so independently. This oral care serves the two-fold purpose of manually removing cariogenic microbial species and imprinting healthy oral hygiene habits.

The research in this project examines tooth brushing as the means of removal and the parent-child interaction involved. To carry out tooth brushing, there are a variety of available products on the market, but this research focuses on the finger-style pediatric toothbrush. This product features a single silicone shell that is worn onto a finger which performs the scrubbing and brushing motion in the oral cavity. When used during the period of a child’s primary (developing) dentition, it has been reported to be preferred over a traditional toothbrush. Users prefer the greater comfort and control it provides. On the child, tender bristles are less threatening to exposed gum line. For the parent, a finger is more intimate and can be maneuvered easier than alternative foreign objects. However, as the company Nurturley Inc. notes, the current offering has one major shortcoming. Consequently, Soft Chomp™ was developed as the improved pediatric finger toothbrush.

Families from the SDSU Children’s Center were invited to participate in a longitudinal survey study where their pre, peri, and post brushing experiences with an assigned pediatric finger toothbrush were recorded. Preliminary analysis of the data from this study provides interesting insights on the attitudes and behaviors of parents with respect to SoftChomp™ and a leading finger toothbrush. Conclusions from this study also offer suggestion on marketing positioning for the Soft Chomp™ product line.
253  3:15 pm

What Factors Are Associated With How Mexican Migrant Caregivers Self-Report Oral Health Status?

Jennifer Reyes, Health Science/Public Health (U)
Tracy Finlayson, Graduate School of Public Health

Background: Self-reported oral health measures are important to understand since it may inform decisions to seek care. This study explores factors associated with self-rated oral health status. It is important to understand how underserved communities differentiate whether their oral health is fair or poor or better.

Methods: Data analyzed for this study were from the baseline survey (collected in Spanish) of a 5-week educational intervention to increase oral health knowledge, attitudes, behaviors, and hygiene practices among Mexican migrant families in North San Diego County. This sample included female caregivers (N=112) with valid responses on the outcome variable of self-rated oral health status (recorded as excellent or very good or good vs. fair or poor). Several self-reported covariates were included in this cross-sectional analysis: number of dental symptoms, number of teeth lost due to decay or gum disease, self-rated general health status, current dental care need, satisfaction with teeth appearance, and other socio-demographics. Frequency distributions, bivariate associations, and Fisher exact tests were examined for significant associations between the covariates and self-rated oral health status in SPSS.

Results: This sample was primarily homemakers between the ages 18–68 years, 70.3% were unemployed, and 70.3% reported a lot of dental problems (77% reported 2-7 dental symptoms out of a list of 11). The majority (82.1%) rated their oral health as “fair/poor” (FPOH), and 56.3% reported fair/poor general health. About one-third (32.1%) reported no lost teeth. Most (85.5%) reported current dental needs. Half (53.6%) reported that they had access to care but 53.2% had not visited a dentist in the past year. Half (55.5%) reported being afraid to visit the dentist. Preliminary qualitative analysis across all transcriptions identified common themes about teens’ dental experiences: miscommunication between patient and provider, mistrust in provider services, and dentophobia.

Discussion: Results from both qualitative and quantitative analyses provided an understanding of Mexican migrant teens’ values and beliefs towards oral health. In illuminating culture, we identified communication barriers between teens and dentists. Mexican migrant teens experienced neglect from dentists during their dental visits. Improving communication between teens and dentists will provide teens the opportunity to take responsibility for their oral health. Study results will inform culturally-appropriate interventions to improve the communication between teen patients and providers.

254  3:30 pm

Illuminating the Pathway to Good Oral Health for Mexican Migrant Teens

Mark Jason Cabudol, Anthropology (U)
Tracy Finlayson, Graduate School of Public Health

Background: The purpose of this formative, mixed methods study is to identify the barriers to dental care and dental visit experiences among Mexican migrant teens. They are a vulnerable subgroup of the Hispanic/Latino population, at high risk of developing dental caries (cavities).

Methods: Mexican migrant teens between the ages of 12-19 in North San Diego County were invited to participate in this study, which used a community based participatory research approach and qualitative and quantitative methods to identify barriers to dental care.

Six focus groups with teens (n=53 participants total, group size ranged 5-20) were conducted throughout July 2015 at Vista Community Clinic’s after-school program sites. A survey was disseminated to each participant at the end of the focus group session. All focus groups were 2–3 hours long, digitally recorded, transcribed, and thematically analyzed. Focus groups and survey topics included teens’ attitudes and beliefs towards oral health and their personal experiences in achieving good oral health. Survey data was entered, cleaned and descriptive statistics were calculated in SPSS. Transcriptions were manually coded and further analyzed using Dedoose qualitative analysis software.

The Behavioral Model for Vulnerable Populations is the theoretical framework guiding the qualitative data analysis in identifying key themes for barriers. Results: Survey results show 21.8% of Mexican migrant teens have not met the recommended guideline of a dental visit in the last year. Some teens (26.2%) reported being afraid to visit the dentist. Preliminary qualitative analysis across all transcriptions identified common themes about teens’ dental experiences: miscommunication between patient and provider, mistrust in provider services, and dentophobia.

Discussion: Results from both qualitative and quantitative analyses provided an understanding of Mexican migrant teens’ values and beliefs towards oral health. In illuminating culture, we identified communication barriers between teens and dentists. Mexican migrant teens experienced neglect from dentists during their dental visits. Improving communication between teens and dentists will provide teens the opportunity to take responsibility for their oral health. Study results will inform culturally-appropriate interventions to improve the communication between teen patients and providers.
**ABSTRACTS**

**STUDENT RESEARCH SYMPOSIUM 2016**

Student Level: (U)=Undergraduate; (M)=Masters; (D)=Doctoral

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**255  3:45 pm**

**Assessing barriers to utilization of dental service among underserved seniors**

Ally Lu, Public Health (U)

Tracy Finlayson, Graduate School of Public Health

**Purpose:** This study was part of an oral health needs assessment of a large convenience sample of community-dwelling, English-speaking seniors at the Gary and Mary West Senior Wellness Center. Predisposing, enabling, and need factors associated with dental utilization and barriers to accessing dental care were examined.

**Methods:** This cross-sectional study was conducted via survey. The survey examined a range of barriers to accessing dental care, dental utilization, as well as information about hygiene practices, self-rated oral health status and sociodemographic characteristics. Unduplicated surveys were collected from 263 seniors between 8/11/15–9/11/15 on various days and times. The Anderson's Behavioral Model of Health Services Utilization was the framework that guided the hypothesis and quantitative analysis. Dental service utilization in the past year was the main outcome. Descriptive statistics were calculated, and a logistic regression model examined predisposing, enabling, and need factors using SPSS.

**Results:** The average participant age was 69.55 (±7.09) years. The sample included 159 (61.2%) males and 101 (38.8%) females. The results indicated 118 (46%) of participants' last dental visit was within the past year, and 208 (82%) participants self-reported currently needing dental care. Cost was reported as a barrier to accessing dental care by 116 (44%) participants. Education was significant, and less educated seniors with a high school degree or less were less likely than more educated seniors to have a dental visit last year (Odds Ratio [OR]=0.48; 95% Confidence interval [CI] 0.26-0.91, p<.05). Uninsured seniors were less likely than insured seniors to have a dental visit last year (OR= 0.47, 95% CI: 0.23-0.97, p<.05). Seniors with no current dental care needs were 2.4 times more likely to report having had a recent dental visit than those that did report needs (OR= 2.41, 95% CI: 1.10-5.73, p<.05).

**Conclusion:** Level of education, insurance status, and self-reported needs were associated with recent utilization. Lack of dental insurance or cost were commonly reported barriers. Future research should identify predisposing, enabling and need factors among older adults to help improve their access and utilization.

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**112  4:00 pm**

**Integrative Species Delimitation of the Thorn Harvestmen Acuclavella (Opiliones, Ischyropsalidoidea) of Northern Idaho**

Casey Richart, Evolutionary Biology (D)

Marshal Hedin, Biology

The field of species delimitation has recently undergone major theoretical and statistical advances. Most taxonomists now agree that the most robust species hypotheses are objectively evaluated using multiple lines of evidence, such as their reproductive compatibility, ecology, behavior, etc. Here, we integrate molecular sequence, phenotypic, and geographic data to generate a priori species hypotheses in the harvestmen genus Acuclavella (Arachnida, Opiliones). We then evaluate these hypotheses in an integrative validation analysis. Our system of Acuclavella in northern Idaho provides an empirical data set ideal for these analyses, with rapid morphological evolution and multiple recent lineage diversifications. Based on these analyses, we re-diagnose species in the genus and identify a new species.

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**Session D-4**

**Oral Presentation: Interdisciplinary**

**Friday, March 4, 2016, 3:00 pm**

**Location: Aztlan**

**256  3:00 pm**

**Induced in vivo reprogramming of cells across germ layers**

Cambria Monroe, Cellular and Molecular Biology (U)

Joseph Lancman, Sciences

Recent studies using in vivo cellular reprogramming have shown that through the ectopic expression of certain transcription factors, somatic cells can be induced into a pluripotent state (iPS cells). In a similar fashion, fully differentiated cells can be directly transformed from one cell lineage to another. This transdifferentiation has been accomplished in producing cardiac myocytes from fibroblasts, macrophages from B-Cells, and pancreatic β-cells from exocrine cells. Despite these advances in cell-fate alterations, in vivo reprogramming of cells has been restricted to those derived from the same germ-layer. The ability to break this barrier and transdifferentiate cells across germ layers will not only help to illuminate the processes governing cell fate, but will also expand the potential applications of in vivo reprogramming.
vivo reprogramming, and ultimately provide a powerful tool for the creation of new therapeutic applications. This presentation describes the initial results of the first successful reprogramming of a mesoderm-derived cell within a live vertebrate model into an endoderm cell. Reprogramming of differentiated mesoderm-derived muscle cells into endoderm cells was accomplished through the forced expression of a specific combination of transcription factors. This was done in transgenic lines to visualize endoderm cells within a live zebrafish model, Danio rerio. By utilizing immunofluorescent imaging, whole mount in situ hybridization, and qPCR data, we can observe the beginnings of direct in vivo transdifferentiation, based on the simultaneous expression of muscle and endodermal markers. This is the first demonstration of in vivo cell fate reprogramming of cells derived from germ layer to that of another, thereby suggesting that somatic cell fate within animal can be altered without limitations.

257 3:15 pm
SDSU Climate Action Plan
Rafael Guerrero, Economics/Philosophy (U)
Steve Barbone, Philosophy

Recently President Hirshmann agreed to commit to the Climate Action Plan. I hope extend my research in order to develop a cohesive model regarding how to develop transportation policy as a means to reduce Green House Gas Emissions that students and faculty are responsible for emitting. It is my goal to work SDSU and other third party affiliates in order to make this goal a reality. Based on my present research it is best to develop a policy mix that includes increasing the prices of semester parking permits and further subsidizing MTS passes among other policies. Also included in this policy mix is incentivizing students to use alternative means of transportation. This implies using bicycles to get to and from school. In order to accommodate bicyclists I suggest we develop facilities that caters to those who commit to these alternative means. Developing showers other than those at the ARC is a starting point, creating more bike lanes on campus is also helpful among other things. We must also develop a marketing strategy that promotes alternative means to get to and from SDSU. My conclusions are the result of research done on other universities that have already committed to the CAP years ago. Universities like UCSD are leaders and should be modeled after if we want to reach the goal of reducing our GhG emissions.

258 3:30 pm
Logan Heights Community Redevelopment Project
Yunyi-Silvia Zhou Liu, Political Science/Business Administration (Management) (U)
John Francis, Management

The goal of the project was to help as many small businesses and micro-entrepreneurs as possible during a fifteen week time period. The three main objective to carry out and fulfill this project were to consult small businesses and micro-entrepreneurs, addressing a common consulting process for these businesses, and gathering data for future use. Additionally, specific objectives were developed for each business client.

A general questionnaire sheet was created with the purpose of getting in-depth information of the businesses. Contact information of business clients were given from either BamE CDC (Community Developmental Corporation), or City Heights CDC. Initial meeting were then set with business clients to conduct the interview to assess the needs of the business. Based on information gathered from the interview, a series of recommendations were developed and/or implemented. From the business clients we worked with, common problems and recommendations were identified and classified. The business clients also served as the set of case studies used to develop a common consulting process for micro businesses. To keep track of the progress of the project, weekly team meetings were held to discuss updates with individual business clients. Google drive was used to organize all the data and research gathered from the different business clients.

A total of five small businesses were consulted from the outcome of this project. A client time-phased process was developed to address a common consulting process. All data from the project, including items that were not used and methods of performing research were collected and organized with the intention that it will create a foundation of knowledge to future projects.

The main purpose of this project was to create a well-developed process that would serve as the foundation for future consulting projects performed by Aztec Consulting with the communities of San Diego. The team outlined the approaches and processes that were found the most effective. This project was met with success, measured by the satisfaction of the businesses helped. All the businesses reported to the team with satisfaction stemming from implementation of the recommendations.
ABSTRACTS

STUDENT RESEARCH SYMPOSIUM 2016

Student Level: (U)=Undergraduate; (M)=Masters; (D)=Doctoral

259 3:45 pm

Transatlantic trade and investment partnership
Carlos Montalvo, Business (U)
Ruth Morales, Economics

The transatlantic trade and investment partnership is a treaty that is currently being negotiated between the European Union and The United States of America. This kind of agreements already exist. In the European Union there is free trade within the states. The United States has signed an agreement with Mexico and Canada (called NAFTA), and recently the Transpacific Trade and Investment Partnership which includes many different countries.

This agreement would generate the biggest free trade zone of the world and would have immense consequences not only economic but also political and cultural. There are many economists that support this agreement using rational evidences but there are other well-known experts against it supported by valid arguments as well.

To support the agreement, it can be shown with macroeconomic graphs that this agreement will enlarge the trade between the parties and that the total welfare will increase, which does not mean that everybody will win. For instance, Singapore has low tariffs and African countries tend to high very high ones trade barriers.

Culturally it would be interesting because both parties have been working together like with the Marshall plan to rebuild Europe after the WWII and this agreement may join even more both sides of the ocean. It would be good if it helps to learns from each other to solve problems faster such as immigration disputes.

However, there are also other valid arguments against the TTIP. One of them is the ecologic differences. In Europe some genetic modified food is not legal while in the United States they are. Opponents also claim that the negotiation are being conducted by lobbies and that the press is not being informed of the details.

As we can see there are pros and cons, and by talking, it may be possible to reach an agreement that would satisfy most of the people and that would make more efficient and specialized companies.

260 4:00 pm

BoatCaster.com: Reinventing the Business of Rowing
Brandt Watson, Economics (U)
Alicia Kinoshita, Civil Engineering

BoatCaster.com is a person to person platform built around the need for underfunded club rowing teams to transport equipment, hire coaches, plan their season, and raise money. Partly as a result of title IX, many men’s collegiate rowing programs are underfunded and unfunded and require student athletes to work together each year to not only pay to compete but fundraise thousands of dollars to do so. While many schools invest in women’s rowing programs to offset the cost of larger men’s sports, the funding and awareness for men’s rowing faded. Racing in boats that cost $35,000 each, oars that cost nearly $400 apiece, and leasing space on desired waterfront property, the expenses are daunting. Coupled with the issue of transportation that requires custom built trailers to haul 60 foot boats, even just travelling to compete requires extensive planning and insider knowledge.

BoatCaster.com will be a website built on OpenLayers open source mapping software that will allow clubs to see which used boats are for sale with pictures and descriptions around the United States. The users will be able to search the inventory by location, brand, year, condition, and hull size to find the perfect used boat at a reasonable price. The site will also feature the ability post coaching positions and other special service both wanted and offered. This will serve to open up both the labor and services market to create a more competitive and effective industry. A key feature of BoatCaster.com will be the availability to show your team’s trailer routes to and from competitions throughout the year. After logging these, they will be entered into a searchable database giving other clubs and rowers the option to pay to have their boats and equipment transported safely by other clubs to where it needs to go without the risk of it being broken or mishandled by those outside the community. The result will be maximizing a club’s resources, turning unused trailer space and unwanted used rowing shells, into revenue that will continue to grow their clubs and foster competition into the future.

261 4:15 pm

A Dynamic Brand Ranking Methodology Using Twitter Data
Sun Hee Kim, Management Information Systems (M)
Bongskil Shin, Management Information Systems

The brand ranking methodologies fundamentally consider two perspectives of brand equity on the focal company: financial perspective and consumer perspective. While the financial aspect of brand equity is relatively straightforward, there is a lot of controversy for how to measure the consumer perspective of brand equity. Currently most commercial brand rating companies such as InterBrand are depending on the traditional approaches like customer surveys or expert judgements for measuring the customer-based brand equity. Thus, we suggest the new approach for dynamic brand ranking methodology to measure the customer-based brand equity using a sentiment analysis system on Twitter data. In facing an extreme growth of SNS users, consumers are expressing their sentiments on the brands in SNS. We focused on the point that the SNS data which is...
embedding the tremendous customers’ opinions and emotions on brands could be the critical resource for measuring customer-based brand equity. However, current sentiment analysis systems are not domain specific, rather developed for general purposes. This means that those systems are not reflecting the unique aspects of brand equity measurement. Thus, we conducted the literature review about academic approaches of customer-based brand equity measurement and constructed the key-word lists which are representative of each four aspect categories of brand equity: brand difference, brand relevance, brand esteem, brand knowledge. The keyword lists include both synonyms and antonyms associated with each aspect dimension. We analyzed the status of those key-words’ frequencies on SNS and its impacts on sentiment scores. Then we combine and adjust those key-words into a general-purposed sentiment analysis system for building up the new brand equity measurement system. For the performance analysis, we gathered a significant amount of tweets of several company brands in three different industries and compared the measurement performance of the newly developed method with customer survey results. We expect that these research results are able to suggest a new approach to measure the customer-based perspective of brand equity using the big data on SNS. This new approach also would be able to complement current traditional methods by providing a more dynamic and rapid way to reflect customers’ perspectives on brands.

262 4:30 pm
Assessments of Individuals with Disabilities between Two Samples: SONA and MTurk
Danielle O’Neal, Psychology (M)
Allison Vaughn, Psychology

Previous research has found that knowledge of governmental assistance programs affect people’s attributions of individuals with disabilities. Specifically, when people are presented with an individual with a disability who is receiving governmental assistance, they view the individual’s disability with less severity compared to those not receiving assistance. The goal of the present study was to determine if attributions of individuals with disabilities changed based on the type of governmental assistance received. Researchers collected online data using Qualtrics software from a college sample from the SONA undergraduate participant pool (n = 198; Mage = 18.48 years; 81.8% women; 42.6% Caucasian) and a community sample from Amazon’s Mechanical Turk (MTurk; n = 205; Mage = 33.21 years; 40% women; 83.9% Caucasian). As compensation for participating, SONA participants were given course credit for Psychology and Communications classes while MTurk participants were given $1.00. Participants were randomly assigned to one of three conditions (no information about assistance; information about financial assistance; information about vocational assistance) and read three vignettes portraying individuals with mental or physical disabilities (chronic pain; depression; cardiovascular disease). The participants then rated how they perceived the individual’s overall limitations, health, friendliness, sincerity, competence, blame, and whether effort would allow the individual to function equally with non-disabled peers. The researchers found little difference in attributions of individuals with disabilities based on types of assistance given across samples. However, between SONA and MTurk, there were significant differences in ratings of individuals with disabilities based on disability type. For example, for individuals portrayed with depression, MTurk gave higher ratings than SONA on measures of overall health, friendliness, sincerity, competence, and effort. Whereas, for someone with cardiovascular disease, SONA rated the individual as being more friendly, but more limited than MTurk; conversely, MTurk rated the same individual as more healthy and better able to fit into society with effort, but assigned more blame for their disability, than SONA. These findings imply that age and experience may contribute to how people perceive and characterize individuals with disabilities. Future research should further examine differences in perceptions of individuals with disabilities across samples of middle-age and older adults.

Session D-5
Oral Presentation: Ancient Cultures
Friday, March 4, 2016, 3:00 pm
Location: Metztli

263 3:00 pm
Germanic and Aztec Holistic Medicinal Practices: A Comparative Analysis of their Healers, Texts, and Medical Beliefs Across Time
Nicole Spuehler, Humanities and Spanish (U)
Maria Rybakova, Humanities and Classics

The way in which humans have taken care of their body and medical needs have evolved exponentially with the passing of time. Some of the most ancient medical practices were holistic in nature, that is, they addressed the mind, body, and spirit in order to achieve health. The purpose of my research is to present the
similarities and differences of holistic medical practices based on plant remedies between Germanic peoples of the High Middle Ages and Aztecs during the Age of Exploration in order to analyze the nature of the world they lived in and discover to what extent they were influenced by the Roman Catholic Church. Even though both Germanic peoples of the High Middle Ages and the Aztecs during the Age of Exploration were heavily influenced by the Roman Catholic Church, there are many differences in respect to the healers Hildegard of Bingen and Badiano-Cruz as well as their medical training and respective texts. Furthermore, their holistic medicinal beliefs based on their principles of health and the cause/treatment of diseases shines light onto how they viewed the world they lived in.

Unlike today, the nature of the world that both of these cultures lived in over five hundred years ago was filled with the belief that physical healing and spiritual healing went hand in hand. Whether or not these beliefs were fanciful, heretical, or delusional, there is no question that the colorful lives of these people breached far beyond a mere physical dimension. What do you think it means when you get sick? Is it a mere pathological agent, or is there something going on a deeper level?

264 3:15 pm

*The Relación de Michoacán and the Florentine Codex: Friars, Scribes, and Contested Authorship*

Jose Renteria, Latin American Studies (M)
Ramona Perez, Anthropology/ Latin American Studies

This essay compares the criteria of contested authorship concerning the *Relación de Michoacán* (1539–1541) to the *Florentine Codex* (1578–1579). In light of partial interpretations regarding a focus on sixteenth-century chroniclers and overlooked roles of the native collaborators of colonial documents, it attempts to answer the central question of why the authorship of the *Florentine Codex* has not been contested in the manner that the *Relación de Michoacán* has. The comparison takes into consideration the role of friar compilers, document composition, and discusses examples of image and textual dialogue that scholars have interpreted as an indigenous narrative that diverged from intended ecclesiastic and Spanish bureaucratic outlooks. While discerning Christian influences, the essay also examines native contribution and pre-contact methods of representation regarding the *Relación de Michoacán* to emphasize that those assessments and conclusions suitably apply to the *Florentine Codex*. The study will assert that neither fray Jerónimo de Alcalá (1508–1545) nor fray Bernardino de Sahagún (1499–1590) stood as authors, but rather as compilers of their respective chronicles. Since both friars recorded indigenous accounts and used native sources, in a real sense authorship rests on the native contributors.
children or those who nurture children. Ogden’s books *Greek and Roman Necromancy* (2001) and *Magic, Witchcraft, and Ghosts in the Greek and Roman Worlds* (2009) both explore several aspects of Greco-Roman magic, while providing brief mention of children. Here Ogden’s mention of boy exploitation in the sources, albeit always by means of use as an ingredient for the rituals performed. Ogden presents reasoning for the use of children, specifically boys, and dedicates a chapter to the use of boys in ancient magical rituals.

Sources for magic and witchcraft accusation in historical periods post-dating the ancient Mediterranean have taken into account not only the presence of children in magic, but what agency children harbored in relation to witch trials, accusations, and accused. For example, Early Modern scholarship and Early American scholarship (primarily related to Salem witch trials) have noted the presence of children more explicitly. Why is there more modern scholarship on the presence of children in magic, compared to Greco-Roman sources available? What accounts for this lacuna in scholarship and evidence?

This research will employ their explorations of children in the world of Greco-Roman magic, and apply comparative research on the presence of children in Greco-Roman magic-related sources to sources of the Early Modern period to more modern sources relating to Salem witch trials and even modern day presence of children in magic. Utilizing these historians, sources from *PGM*, and modern sources, in an attempt to fill the void left by previous scholars with respect to the role of children in Greco-Roman magic.

**267  4:00 pm**

*The Unique Tapestry of the Hellenized Jew*

Samantha Young, History (M)
Walter Penrose, History

In this research I explore the question of the influence of Hellenization on the Jewish population of Alexandria in the first century BCE. In a study of the Jewish communities in Alexandria I look at the Hellenization of Jewish public life, of Jewish philosophy, Biblical stories and finally religious practice, with an emphasis on women in particular. In each of these categories I look at where Greek ideologies either influence new notions or where traditional Jewish concepts remain the mainstream. I draw heavily from the writings of Philo as a primary source along with a number of other excerpts from ancient Greece to find evidence of overlap and influence. The hope of this research is to address the intricate intermingling of these ancient peoples and to present a social history with a look into the image of women.

**268  4:15 pm**

*Theatrical Radicals: Indigenous Challenges to the Three Unities*

Desmond Hassing, Theatre Arts (M)
Michelle “Shelley” Orr, Theatre

In his 1974 book *Teatro de Oprimido* (Theater of the Oppressed) Augusto Boal argues that all theatre is by necessity political, for “all the activities of man are political and theater is one of them.” (Boal 1979 pp. ix). Boal goes on to suggest that the Aristotelian definition of tragedy is a “coercive system” which forcibly interpolates the viewer by creating representations of “privileged” characters he refers to as “Tragic Heroes” who through a tragic downfall inspire in the audience a catharsis which leads to “a purgation of all antisocial elements” (Boal 1979 pp. 46).

Using this argument by Boal as a frame, I will endeavor to show that Aristotle’s three Unities (the Unity of Time, The Unity of Space, and the Unity of Plot) operate as tools of Colonization, suggesting a commonality of human experience that is representative of a viewing of human experience that privileges white culture dominance and encourages assimilation. That these specific storytelling tools which descend from the ancient Greeks remain with us today, albeit with slight adaptation, in modern tragedy and continue to privilege Western culture over Non-Western culture. Not content only to explore the contours of the problems presented by colonization in the theatre, I will further argue that playwrights can attempt to decolonize the theatre by inverting the three Unities and presenting stories which feature non-linear stories and subjective sets by comparing Arthur Miller’s *All My Sons*, as a representative of modern tragic drama, to Kiowa/Delaware playwright Hanay Geiogamah’s *Foghorn* and Métis Playwright Marie Clements’s *Burning Vision*. 
269  3:00 pm  
**Gendered Perceptions of Soviet Women in the New York Times during World War II**

Tia Dang, History (M)  
Annika Frieberg, History

This research is one chapter of a Master’s thesis on the *New York Times*’ coverage of Soviet Women from World War II and into the Cold War. During World War II, the Soviet Union and United States were obligatory allies against the Axis powers; however, political relations between the two nations quickly deteriorated following the end of the war in 1945. This shift in U.S.-Soviet relations is reflected in the American news coverage of Soviet women and their position within the war and post-war Soviet society. As political tensions grew, Soviet gender roles became a sign of weakness within the communist system.

By the mid-20th century the *New York Times*’ reputation for unbiased and objective reporting made it a leading source for national and international news. During World War II foreign correspondents in Moscow brought to America images of the Soviet Union and their wartime achievements. A textual analysis of the *New York Times* articles reveals how American gender ideals were used to understand the roles of Soviet women within public and private spheres. Many of the same gender roles and traits that appear in the World War II coverage of Soviet women appear in Cold War articles; however, with the changes in political relations came changes in the American new media’s interpretation and perception of these gender roles.

This chapter examines a collection of *New York Times* articles from 1939 to 1945 that reported on stories of Soviet women who participated in the war effort not only from the home, but in labor intensive jobs and combat. The Soviet mobilization of women into labor and military positions were characterized as masculine by American gender ideals, therefore requiring a reimagining of Soviet women that allowed for a wartime alliance but also established the “otherness” of Soviet society. As allies united in war, news media celebrated the war efforts of Soviet women while creating a clear distinction between American and Soviet society and culture.

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270  3:15 pm  
**The Power to Decide: The Subversion of Androcentrism in **  
*Mujeres de ojos grandes* (1990) by Angeles Mastretta

Miroslava Alvarado, Spanish (M)  
Lauren Applegate, Spanish

The text by Angeles Mastretta, *Mujeres de ojos grandes* (1990), points to the social changes that occurred in Latin America pertaining to situation of women and their fight for their equal rights and freedom in society. Set in early twentieth century Puebla, each story follows an episode in the life of different women, connected by the shared title of “aunt.” The protagonists are women, who are only educated to work and care for their husbands and children, but all of them, although different, are visionary and show a rebellious yet subtle strength breaking with the rules and traditions that society has imposed on them.

In this session, I will present and discuss textual evidence to argue that women in *Mujeres de ojos grandes* are vessels of a female wisdom that leads to emancipation. This is achieved through the development in each of the characters of a consciousness of inequality of their social and personal positions. By means of choice—choosing whom to love, how to love, how to use their bodies—these characters subvert an androcentric society that subjugates their very existence. The aim of this analysis is to demonstrate that the nonconformist attitude of the women characters created by Mastretta impose a femininity based on strength, that leads to their emancipation and independence.

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271  3:30 pm  
**Hip Hop: An Expression of Social Dissent and Political Engagement**

Matthew Sawh, History (M)  
Eve Kornfeld, History

Hip Hop music has had a major impact on popular culture since the late 1970s. While it has transformed over the years to include what is more commonly known as “Gangsta Rap” there are several artists who have made it a point to create more “Conscience Rap.” This includes lyrics and music videos that address social issues including poverty, violence, gangs, drugs and more recently gay rights. An analysis of the songs, videos, interviews, blogs, responses to reviews and critics, biographical information and music production as primary sources, will provide insight on purpose for these artists making the music that they made.
An in depth look at the social state of New York City provides the background for the creation of socially aware Hip Hop music by artists from New York. Things they saw on a daily basis influenced the music they made as they attempted to bring national attention to the suffrage of people below the poverty line.

Many have written about Hip Hop and they have written about artists in Hip Hop. A comparative analysis of their writings is necessary to produce a clear image of what has already been written on the subject, but more importantly, to establish what has not been covered in detail. In order to fully understand the message in the music, it is important to understand why the message was created to begin with. An analysis of the backgrounds of the artists will help to better understand the motivation of why they rap about social dissent and political engagement in their songs.

272  3:45 pm
Rainbow Edge: Seeking Meaning for Fractured Gender and Sexual Identities through Performativity
Zhenyu Tian, Communication (M)
Kurt Lindemann, Communication

The performance and negotiation of gender and sexual identity has never been an easy task for people who identify themselves with lesbian, gay, bisexual, transgender, and queer (LGBTQ) group. Failure in finding the meaning of their identity is always followed by destructive emotions. In a postmodernist paradigm, Performativity argues that identity is not stable and fixed, but is instead changeable and fluid. Identity therefore should be identities. Gender and sexual identity is constituted in a process of performative embodiment of socially constructed meaning. As a Chinese young man from an only child family, my gender identities carry the historical meaning from a system that shows unshakable heteronormativity. My naturally given body, however, is homosexual. This already problematic combination has evoked more identity crises when I became an Asian gay man in America. This autoethnographic project therefore utilizes a performative composition strategy, aiming to find meaning in these crises for myself, as well as other people who has been involved in the same quandary. This essay finally suggests that performativity provides a good approach to acquire personal ontological meanings.

274  4:00 pm
The Destruction of Binary Gender Identity in Popular Culture Representations
Iris Farrou, Rhetoric and Writing Studies (M)
Suzanne Bordelon, Rhetoric and Writing Studies

This project analyzes the ways in which contemporary representations of gender identity deconstruct the gender binary, as this is more commonly understood through either a female identity or a male one. More specifically, my examination focuses on digital artifacts that exist in widely accessible platforms, such as Ruby Rose’s short YouTube film “Break Free.” My analysis of this text argues that on some level it still functions within the gender binary, thus failing to promote gender non-conforming identities. However, a closer examination of its rhetorical strategies reveals that it also portrays gender to be fluid and performative. When viewed through the lens of gender performativity, “Break Free” actually serves the purpose of breaking down the binary of femininity versus masculinity and seems to be promoting a less solidified perception of gender expression. As this project consists of two parts, my presentation will discuss at length one of the strategies through which “Break Free” upholds the gender binary and will refer briefly to how through this strategy we can detect Rose promoting gender fluidity. The strategy in question is the visual break in gender expression that occurs halfway through the film. In the first part of the film, Rose portrays herself as distinctly female, while in the second she performs a masculine persona that supports traditional images of maleness. Since this visual break is quite notable, the film suggests that there is a clear distinction between the world of maleness and that of femaleness. At the same time, however, what lies beneath this visual distinction is the act of performance: Rose does not exist as either female or male, but she performs both. By being aware of the performance’s existence, the audience can understand that gender fluidity is indeed promoted through “Break Free.” In my project, I utilize rhetorical analysis to examine a rather popular piece belonging to the area of Transgender Studies, thus contributing to the collaboration of Transgender Studies and Rhetoric.

Session D-7
Oral Presentation:
Philosophy: Metaphysics, Ethics & Continental
Friday, March 4, 2016, 3:00 pm
Location: Visionary Suite

275  3:00 pm
A Critique of Scientific Knowledge and Contemporary Psychology
Ricky DeSantis, Philosophy (U)
Marie Draz, Philosophy

The aim of my analysis is to critically examine pursuits of objective truth and knowledge, especially within contemporary Anglophone psychology. As the “study of the soul” has evolved to become more closely aligned with the biological sciences, questions regarding the nature of human subjectivity and the types of knowledge we can hope to attain have seemingly been passed
over. I hope to reopen some of these questions in my project by means of the following three moves: (1) a return to Nietzsche’s critique of objective truth and his explanation of concept-creation found in his essay “On Truth and Lies in a Nonmoral Sense”. Nietzsche’s argument against objective truth in favor of perspectivism lays the groundwork for my second move. That is, (2) a reading of Michel Foucault’s essay “Nietzsche, Genealogy, History” in which he explores the consequences of Nietzsche’s perspectivism, particularly pertaining to power relationships within discourse. Foucault argues that dominations of discourse manifest within a culture’s customs, rituals, infrastructure, and language. This leads me to my conclusion (3) in which I describe how the Diagnostic and Statistical Manual of Mental Disorders is a classic example of taking concepts too seriously as capturing objective truth. I argue that this objective mindset which is symptomatic of twenty-first century scientism is dangerous because it causes us to overlook the perspectival experiences of subjects in favor of universal abstractions.

276  3:15 pm
Mathematics and Free Will
William Riekstins, Philosophy (U)
Steve Barbone, Philosophy

Philosophers as old as Pythagoras have engaged in debates about whether human beings have freedom of the will or if every action and thought is predetermined by previous actions and thoughts. One argument against freedom of the will is the notion that all of life is mathematical and therefore it would be calculable to determine what the causal factors are for each and every action or thought. In my oral presentation I will concede the possibility that all of life may be mathematical, but that does not logically suggest that there is no such thing as freedom of the will.

277  3:30 pm
The Banach-Tarski Paradox: A Philosophical Validation of Democritean Metaphysics
Ryan Stanford, Philosophy (U)
Mark Wheeler, Philosophy

Since its conception, the Western tradition of philosophy has long been influenced by the process and study of mathematics, beginning in ancient Greece with Plato, who studied the ontological status of mathematical objects, and Aristotle, who studied logic and issues related to infinity. Through the mathematical works and discoveries of Pythagoras, Hippasus and Euclid, Plato and Aristotle developed many of their revolutionary philosophical arguments, and by extension, dramatically influenced the philosophical process of the West. Coherently, the same interplay of mathematics and philosophy is still vital to the philosophical process in the West, as the exponentially expanding depths of mathematical knowledge continue to impact how philosophers develop, understand and interpret philosophy in the modern age. Two millennia later, in 1924, theoretical mathematicians Stefan Banach and Alfred Tarski published a paper containing one of the most celebrated paradoxes in mathematics; one that contained greater philosophical significance than either could have ever estimated.

278  3:45 pm
Martha Nussbaum: The Fragility of Goodness
Keitel Del Rosario, Philosophy (U)
Mark Wheeler, Philosophy

Throughout our lives we are faced with, and are in, our own individual sets of circumstances—people might be able to succeed in large part because of his or her parents’ financial circumstances; one, on account of the country she is born in, might face a variety of problematic or limiting social or legal issues. Both these examples, and a great number more, are able affect a person’s well-living. In her book, The Fragility of Goodness, Martha Nussbaum explores the ancient views of “moral luck,” examining the ethical problem that the constituents of an agent’s good life, are vulnerable to external factors that are not under the agent’s influence.

Nussbaum argues that we do live in and must endure these external influences, and that they affect human life. Because of this, luck is a serious influence on the good life, in which external factors can, and most likely will on some level, affect the agent who is also in control of it, causing particular fortuitous or adverse circumstances. Whether it is good luck or bad luck—where a person is was born, what his or her socioeconomic status is, one’s gender, or the many other circumstances caused by fortune—the things that happen by chance have considerable power to alter the status of an agent’s well-living. All this considered, luck, as a cause, seems to be something significant in a human life.

279  4:00 pm
Illuminating the Essential Features of Kant’s Synthesis of the Imagination
Monica Gonzalez, Philosophy (M)
Steven Barbone, Philosophy

The transcendental power to generate ideas is described by Immanuel Kant as a set of principles that direct the faculty of human cognition as well as experience. My research examines the critical project undertaken by Kant in the Transcendental Analytic. Although Kant emphasizes the unification of the productive feature of the imagination, it is also essential for the imagination to produce and track the many differences therein. Therefore, I address the issues of completeness in Kant’s general interpretation of the function of the imagination, thereby asserting...
the central function of the activity performed by the imagination. My aim is to further illustrate and develop the particular features of the activity of unification done by the imagination, and in doing so, I will also develop the latent features of the transcendental function of the imagination.

280  4:15 pm  
**Equipment, Technology, and Worldhood in Heidegger**
Alexander Misthos, Philosophy (M)  
Steve Barbone, Philosophy

It is not an uncommonly held view that there is a distinct, and easily identifiable split between Heidegger’s more straightforwardly phenomenological early period (exemplified in his magnum opus “Being and Time”) and his more obscure “poetic” later thought. My aim is to undermine this conception of Heidegger’s work by showing that it is possible to read one critical aspect of his later thought (his philosophy of technology) as being consummate and contiguous with his thought as it was beginning to be expressed in *Being and Time*.

This research looks at Heidegger’s account of technology through both his early work *Being and Time* and in his later writings, particularly “The Question Concerning Technology,” in which an account of technology is put forth that would seemingly bring Heidegger’s later thought into some kind of contradiction with what he said in his earlier works on the issue. Over the course of this project I will attempt to argue that no such contradiction obtains between the early and later thought, as is evidenced by the accounts of disclosure provided in both accounts. It will be shown that if one attends closely to Heidegger’s overall account of disclosure then any apparent contradictory tendencies between the two accounts are quickly resolved and both can be accommodated under his contiguous thought between the two periods.

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**Session D-8**

**Oral Presentation:** Communication, Place, & Health  
Friday, March 4, 2016, 3:00 pm  
Location: Legacy Suite

281  3:00 pm  
**Effects of family communication styles on pro-environmental behavior and parent-child interaction**
Llewelyn Labio, Communication (U)  
Vinod Sasidharan, Hospitality and Tourism Management

This study examined the relationship between parents’ self-reported communication styles and their pro-environmental behaviors, including transfer of sustainability awareness to their children. Several studies reveal that parents’ pass on their consumer behavior qualities to their children. Studies also suggest environmental identity is formed based on social constructs. Furthermore, environmental identity becomes more prevalent after having children (Arnett, 2007). According to Schlegelmilch et al. (1996), consumer’s awareness and knowledge of environmental sustainability results in the formation of their attitudes and purchasing decisions. Communication is a crucial agent for parent-child interaction. Studies examining the importance of child rearing and future behaviors of children (Sharp, 2002) argue that parent’s play a salient role in the formation of children’s pro-environmental behaviors (John, 1999). Pursuing this further, prior investigations have found that social norms affect pro-environmental behavior (Biel & Thorgerson, 2007). This study hypothesized that parents’ communication styles will have an effect on pro-environmental communication and that parents’ interaction with their children will affect their children’s future pro-environmental behaviors. A survey was administered face-to-face to a sample population of parents at San Diego State University Children’s Center. The survey consisted of demographic questions as well as items relating to environmental behaviors, communication styles, and beliefs and values on child rearing, assessed through a five point Likert Scale. The findings reported a positive relationship between communication styles and pro-environmental behaviors. Based on prior studies, these findings suggest that pro-environmental behaviors are transferred to children through various parental communication styles. These results will aid parents who identify with environmental identity with the knowledge of what type of communication are most effective to pass on family beliefs and values regarding environmental sustainability.

282  3:15 pm  
**Indoor Location-based Mobile Application to Study Hospital Interactions**
Tim Schempp, Geography (U)  
Atsushi Nara, Geography

One of the major issues in today’s healthcare settings is a breakdown in communication. Poor communication, or fragmentation, in a hospital can lead to medical errors and ultimately cause adverse events, and hospital acquired infections. We hypothesized that establishing an effective communication structure within these workplaces will beneficially impact hospital outcomes in regards to quality of patient care.

In order to test the hypothesis, it requires the measurement and the evaluation of individual interaction and communication structures. However, healthcare organizations and systems are busy, complex, multi-dimensional and occasionally chaotic under a constant demand from policy makers, health care analysts, and funders to deliver the best possible health care. Under such...
complex environmental conditions, it is a non-trivial task to quantify their interactions. Furthermore, the qualitative survey-based approach, which is common in practice, is limited by cost and scale without interrupting individual daily activities.

Location-aware devices and mobile technologies have enabled the recording of personal whereabouts at fine spatial and temporal resolutions. We proposed an automated approach using this technology which has the capability to study individual interaction and communication structure at a large-scale of study in a cost-effective and non-invasive manner. In this study, we developed a mobile application, through an iterative prototyping process, that systematically detects and records nearby wireless devices, their identifying information, and their associated signal strength.

Specifically, this was achieved through the use of Bluetooth and Wi-Fi smartphone functionality. The signal strength value is the key variable for determining proximity, as the variation in its magnitude may correlate to distances between entities. Initial findings confirm the tool’s ability to collect the interaction data over the course of a 10 hours per day over a three month period, while adhering to a user-defined capture interval. This data allows for further quantification and evaluation of interactions and communication structures related to hospital outcomes.

283  3:30 pm

Validating Survey Measurements in Language Services and Cultural Competency in U.S Hospitals

Yaritza Benitez, Psychology (U)
Melody Schiaffino, Public Health

In the United States almost 60 million of the population speak another language other than English (Schiaffino et al. 2014). There are many Limited English Proficiency patients in the United States suffer from adverse effect in hospitals due to the language barrier between patients and health care providers. By federal law U.S hospitals are mandated to offer Language Services (LS) to LEP patients (Schiaffino et al. 2014). The Culturally and Linguistically Appropriate Services (CLAS) standardizes hospitals’ language services. Although there are standards, less than 20% of hospitals offer adequate LS services (Schiaffino et al. 2014). It is important to be able to measure how well hospitals are performing in order to address where they may need improvement.

A two state sample survey conducted in all California and Florida hospitals with an average response rate of 34% was used to populate a principal component analysis. All data analysis were conducted in SAS 9.4. Running a principle components analysis will help us distinguish if the survey variables cluster into main components when measuring language services. A critical value of (.50/√C1) was used to determine which variables fell into the same component. For those variables who fell into two components, the highest correlation determined if they stayed in that component.

The principle component analysis (PCA) included 8 variable questions about language services. The measure of correlation for PCA is Eigenvalues that ranged from .993 and 3.152. From the 8 variables three components where found: “Interpreters,” “Translation Materials,” and “Signage.”

The increase diversity in the population demands hospitals to be more culturally competent to improve the health of patients. In order to evaluate whether hospitals are doing a good job in offering competent care there must be an adequate and precise way of measuring their culturally competency. Further analysis is still needed to determine whether we are accurately measuring the competency of hospitals in language services.

284  3:45 pm

A Geospatial Perspective on Community Development

Kristen Monteverde, Geography (U)
Atsushi Nara, Geography

The applications of geographic science are far in their reach but unknown to many. Specifically, Geographic Information Systems, more popularly known as GIS, have huge potential to improve the overall quality of our neighborhoods and cities. This study focuses on applying the wide ranging capabilities of GIS to city parks and recreation services, which are key in maintaining and developing community character. Additionally, this study focuses on the collaboration of storm water inlets and elevation data to discover sub-basin locations which allow for more efficient management of storm water pollution hot spots. The City of Santee, partnered with the Sage Project at San Diego State University, asked student researchers to collect, organize, and develop a database of all city assets located at seven city parks and key commercial portions of Mission Gorge Road. In this project we employed field data collection methods which involved using a team of students on weekly field trips, and cutting-edge mobile geospatial technologies. This resulted in hundreds of collected data features, representing where Santee has invested money into their city by means of signs, lights, benches, and storm water inlets. Then, using GIS technology, the information was processed according to a standardized pattern in each data table and submitted back to the City of Santee for use by city employees. By providing GIS based decision support tools, we as researchers assist Santee gain a better understanding of where taxpayers’ money is spent, and how to identify pollution sources more efficiently. This allows for the city to better invest in community character and facilitates a sustainable future for Santee.
ABSTRACTS
STUDENT RESEARCH SYMPOSIUM 2016
Student Level: (U)=Undergraduate; (M)=Masters; (D)=Doctoral

285 4:00 pm
Potential Stressors Stemming from the Minority Experiences of Asian-American and Pacific Islander Women
Amanda Whiteley, Psychology (U)
Vanessa Malcarne, Psychology
Background: Currently, there are nearly 15 million Asian Americans and Pacific Islanders (APIs) residing in the United States (US). Amongst all ethnic groups in the US, APIs reportedly have the highest household income and education levels, which have promoted the perception of them as the model minority. However, this perception belies the breadth of social and cultural stressors, such as economic and acculturation hardships and pressures, endured by various API groups. These stressors may be important risk factors for emotional and mental health problems, but have received limited attention. Therefore, this study endeavored to provide insight into the potential stressors found in the minority experiences of APIs.Methods: Adult API women (N = 62) completed paper questionnaires and were individually interviewed in San Diego County. Questionnaire data included self-reported socioeconomic status, the Scale of Ethnic Experience, and the MacArthur Scale of Subjective Social Status. Interview data involved participants’ discussions about their minority status in the US. Results: Descriptive statistics of questionnaire data and descriptive/interpretative analysis of interview discussions will profile potential stressors related to social status, acculturation, and cultural values and expectations of API women in San Diego County. Discussion: Results from this study will supplement existing research on the mental health of APIs by uncovering potential stressors faced by Asian and Pacific Islander communities that may lead to emotional or mental health problems. With a better understanding of stressors experienced by APIs as minorities in the US, researchers and practitioners can work towards ameliorating these stressors to improve or preempt emotional and mental health issues.

286 4:15 pm
Sexual violence among orphaned children in Botswana: identifying risk and protective factors for effective prevention and response
Kazi Priyanka Silmi, Public Health (D)
Susan Kiene, Public Health
Statement about the problem: In context of Botswana’s high HIV prevalence and large number of orphan children, sexual violence on children is a significant challenge in the country. Through service providers’ accounts, this study aims to identify the factors that put children at risk and explore protective factors that can facilitate safety of the children Method: This qualitative study employed semi-structured interviews to gain an in-depth understanding of sexual violence on children from service providers. A convenience sample of 23 service providers were recruited from the community-based organization Stepping Stone International and its partners providing service to children and sexual violence victims. Inductive coding and content analysis were used to identify categories and themes in the transcripts. Coding analyses were conducted using NVivo software (version 10). Results: The service providers confirmed that sexual violence against children in Botswana is both pervasive and dire. Correlates and consequences associated with sexual violence included, psychosocial problems (depression, decreased confidence; social withdrawal); teen pregnancy, educational problems (diminished academic performance, school drop-out) and propensity for repeat victimization. Risk factors for sexual violence included household dysfunction (absence or insufficient parental care, lack of family cohesion); economic limitations (poverty, economic dependence on the perpetrator); socio-cultural rules/expectations (children lack a “voice” in society; prohibition on discussing sexual matters), lack adequate support infrastructure. The protective factors include adequate parental care, assertive skills to decline to sexual advances, education about gender issues and safe spaces with adult support. Home was identified as the riskiest places where perpetration occurred with acquaintances and family members as the most likely perpetrators. Service providers called for increased government attention to the issue of sexual violence in the same way HIV/AIDS is being tackled in the country. Conclusion: Taken together, the culture of silence around sexuality and the social expectation that children should be seen and not heard provoke and perpetuate violence. Neglecting policy and programmatic attention to sexual violence puts Botswana at the risk of being able to sustain its successful HIV management. With large percentage of its population under 18, Botswana must take proactive actions to address sexual violence on children.

287 4:30 pm
'It's about wholeness': Understanding the Geographies of Indigenous youth health in San Diego
Lydia Wood, Geography (D)
Kate Swanson, Geography
San Diego and Northern Mexico, the ancestral territory of the Kumeyaay people is home to a diverse Native American urban community and twenty-three reservations. Centuries of colonialism has not only diminished Native American communities’ connections and access to ancestral territory but has also led to a range of well-being and health struggles, from diabetes and poverty, to poor mental health associated with historical and intergenerational trauma. While there have been many studies exploring the health outcomes of Indigenous communities and connecting these outcomes to legacies of
colonialism, few studies have tried to understand health and well-being from the perspective of Indigenous youth. In this presentation I discuss the methodology and initial findings from my ongoing research that examines the social, historical, and geographic factors that shape Indigenous youth health and well-being in San Diego and I explore how these factors are understood and experienced by Indigenous youth. I discuss the ways in which health and well-being are constructed by Indigenous communities, and in particular by Indigenous youth, and the agency of Indigenous youth in shaping their health and well-being in potentially empowering and/or limiting ways. In particular, I discuss the complex political and emotional geographies youth draw from when navigating and expressing their experience of health. I conclude by arguing that efforts to understand and combat health disparities would better serve Indigenous youth if they prioritized indigenous knowledge and experience and took the geographies of Indigenous youth lives as an important starting point for combating health disparities.

Saturday, March 5, 2016
Session I: Oral Presentations

Session I-1
Oral Presentation: Tinker Group 1
Saturday, March 5, 2016, 9:00 am
Location: Pride Suite

288 9:00 am
Family Planning, the Fertility Problem, and Inequality in Cuba: Socioeconomic and Racial Implications for the Next Economic Crisis
Alana Rodriguez, Latin American Studies and Public Health: Epidemiology (M)
Ramona Perez, Anthropology/Latin American Studies

My research hypothesizes that institutional barriers to reproductive freedom and fertility in Cuba are responsible for a dangerously low fertility rate that puts the Cuban economy in jeopardy of not being able to support an aging population. Traditional models that show that indicators of high education, good health and access to contraception have a negative correlation with fertility fall short of explaining the Cuban experience. While Cubans do tend to have higher education levels, health, and access to contraception than other developing countries' populations, the unique social and economic model of Cuba has greater influence on reproduction than these indicators. My preliminary research in Cuba explored barriers to reproduction through data provided by Cuban scholars and medical professionals and macro data released by the Cuban government. I compared these data to the lived experiences of Cuban people. My research demonstrates that institutional barriers such as a severe nationwide housing shortage, crumbling infrastructure, continuous cuts to food and clothing rations and low salaries lead women and men to proactively avoid reproduction in an ever-contracting economy. Cuba's recent attempts to increase fertility have been dismal failures as the larger systemic issues mentioned above have not been included in their campaigns. Although Cuba has been addressing economic stagnation by slowly opening its economy to a small private sector, increasing foreign remittance caps and investing in tourism these economic opportunities are unevenly distributed. Previous patterns of racial inequality that dominated prior to the Revolution are once again emerging as the majority of those with access to capital through remittances or customer-facing tourism jobs are overwhelmingly light-skinned. I argue that this racialized division will not only put the light-skinned elite in a more favorable position to thrive...
in an unequal economy but also that they will be in a more favorable position to overcome the institutional barriers to planned reproduction, leaving fertility as a privilege of the elite. This could lead to a catastrophic demographic shift in Cuba and a threat to the very foundation of Cuba’s socialist and egalitarian model.

289 9:15 am

Bullets and Babies: The Effects of Narcotraficante Related Violence on Reproductive Life Planning on the Coast of Guerrero, Mexico

Sarah Friedman, Public Health (M)
Alan Mobley, Public Affairs

The city of Zihuatanejo and neighboring fishing village of Barra de Potosí (Barra) on the coast of Guerrero, Mexico have experienced rises in violence related to the narcotraficantes (drug traffickers) since 2006. This violence is mostly public killings with bombs, guns, and dismemberment and decapitation. Reproductive life course planning and life trajectories of youth are directly affected by environments of violence because of environmental unpredictability and trauma caused. In this region, I explored the effects of narcotraficante violence on reproductive life planning. I hypothesized that previous generations with less violence exposure differed in their reproductive planning than the youth of today.

In July of 2015, I conducted a case study using semi-structured interviews and focus groups in Zihuatanejo and Barra. Interviews sought to identify exposure to narcotraficante violence and considerations in reproductive life plans. Ten interviews and 2 focus groups were conducted with 24 participants.

Every participant had been exposed to narcotraficante violence and many cited “emotional” effects. For the youth, ages 16–29 and mostly rural, life course strategies that emerged were education, ambivalence, and love. This group had attitudes of annoyance and admiration toward the narcotraficantes. The older group interviewed were women from Barra and all mothers. Their reproductive life courses were determined by love and little to no agency. Their attitudes toward the narcotraficantes were fear and judgement. The concept of no agency in life planning was common. Given ubiquitous available family planning services, it is compelling that 9/20 women from Barra had unintended pregnancies or were forced to marry for honor. There is potential for research in this region regarding the differences in unintended pregnancy and trauma given the family planning services variable.

290 9:30 am

Ideology of the Middle Class in Colombia: Towards a General Theory of Democratic Consolidation

Andrea Arango, Political Science (M)
David Carruthers, Political Science

When trying to understand the Colombian process of democratic consolidation, Latin American literature does not provide an accurate explanation of the Colombian case. Scholars on Latin America have mostly overlooked this case, perhaps because it does not fit well with the general theories of democratization in the region. When most of Latin America fell into dictatorships during the Cold War, Colombia avoided military governance. When the economic crises of the 1980s engulfed the region, the Colombian economy had a better record than most other countries in the area. Also, Colombia was the earliest country in Latin America to achieve electoral democratization—Colombian electoral democracy has been uninterrupted since 1910 (Taylor, 2009).

Colombian exceptionality within the region is intriguing, but even more puzzling is the fact that despite its high levels of violence and an ongoing civil war since 1966, Colombia has maintained internal constitutional stability, and held uninterrupted and regular elections. Contrary to common assumptions, social unrest has not affected the functioning of Colombia’s electoral democracy. Of course the quality of Colombian democracy is not as high as it could be; despite its stability, it is clear that Colombian regime is not a consolidated democracy. With a high amount of human rights violations, civil violence, criminality, and other social challenges, the country is still far from a full liberal democracy.

Consequently, the Colombian case provides a challenge to Latin American literature in two ways. On the one hand, it challenges the Schumpeterian definition of democracy, since Colombia indeed has in place the minimum procedures to guarantee a delegative, majoritarian, procedural, and competitive democracy, but it falls short of full democracy. On the other hand, it challenges the basic requirements for democratic consolidation; the durability of electoral democracy has not been a sufficient condition to become a consolidated democracy. Therefore, this project poses the following research questions: Why has Colombian democracy failed to consolidate into a substantive liberal democracy, even though it has been an electoral democracy since 1910? What would be the substantial requirements Colombia would need to meet in order to be recognized as fully democratic?
Exploratory study of health risks and protective factors among adolescent children of migrants in a Maya community in Yucatán, México

Isela Martínez SanRomán, Public Health & Latin American Studies (M) 
María Luisa Zúñiga, School of Social Work

Prior research with children of Mexican migrants with one or both parents who have migrated to the United States (U.S.) reveals that these children may face adverse mental health outcomes including emotional hardships and resentment (Dreby, 2014). Research is sorely lacking on youth risk behavior, mental health, and resilience factors that could impact adolescent health in the context of family migration.

As part of ongoing research with a small, rural community in the state of Yucatán, Mexico, we undertook this exploratory qualitative study to investigate risk behaviors (drug consumption, school truancy, sexual risk behaviors) and protective factors (school environment, high-school degree completion, family connectedness, etc.) that could influence the health and wellbeing of Tunkaseno youth with migrant parents. Teachers and administrators from the local high school assisted the researchers in identifying adolescent youth ages 15 to 18 with one or both parents who have migrated either nationally or internationally from the town of Tunkás. Community parents were also identified both from students and through researcher relationships with community members. Once prospective participants gave voluntary and informed consent, we conducted in-depth interviews with high school students, parents of youth, and conducted a focus group with teachers from the community. This study was approved by the SDSU IRB ethics board (viRB# 2095101).

We interviewed a total of 15 students (9 females and 6 Males), 11 parents of high-school-aged youth and completed one focus group with local high school teachers (N=7). Preliminary results indicate that youth with absent parents understand how their experiences have challenged their own development. Many participants indicated that emotional consequences of parental absence (feelings of abandonment and betrayal, lack of affection and discipline) had a significant effect on youth alcohol and drug consumption. Parents and teachers are weary of the availability of alcohol and drugs in the community and how their students and children have been impacted by the use of these substances.

Participants recognized and even explicitly stated the need for interventions that would provide support for children whose parents are away. The widespread availability of alcohol and drugs in the community is an area of needed intervention.

Carbon Particle Tracking and Oxidation in a Small Particle Solar Receiver

Trent Martin, Mechanical Engineering (M) 
Fletcher Miller, Mechanical Engineering

Previous analysis for the Small Particle Heat Exchange Receiver (SPHER) has been done on carbon particles, but has been limited to cases where oxidation is not present due to the complexity of the oxidation process and the continual change of the optical properties that dramatically affect the radiation heat transfer in the receiver. In this study, the oxidation rate of the carbon particles in the receiver were calculated based on a given initial particle size, concentration, and temperature. The oxidation rates can then be used to determine the efficiency of the receiver, as well as how long it takes for the carbon particles to fully oxidize as they transit the receiver.

The receiver was modeled using ANSYS Fluent using a 3-D mesh with over 2 million control volumes (cells). Fluent was used to calculate the velocity and temperature at each cell, which was then passed to a UDF (User Defined Function) that was written for this research to track how the particles moved between cells. This was able to be combined with the temperature and particle size in each cell to determine the amount of oxidation through one of three oxidation models considered in this study. Many case studies were then performed by varying some of the initial properties, including the initial particle size and concentration, and the results for exit temperature, mean particle size at each location, and overall efficiency were determined. Results were compared for multiple particle concentrations and sizes to show the effect on the overall efficiency.

The Effects of Receiver Shape and Flow Direction on the Efficiency of a Small Particle Solar Receiver

Ryan Contois, Mechanical Engineering (M) 
Fletcher Miller, Mechanical Engineering

As the demand for renewable forms of energy has become more of a focus, there has been great increase in research and development in alternative energy production. The Combustion and Solar Energy Laboratory at San Diego State University has approached this problem by leveraging solar heating methods in the design of a Small Particle Solar Receiver Model, which
concentrates and directs the immense heat generation potential of solar energy to drive a Brayton cycle and produce electricity. The Small Particle Solar Receiver uses carbon nanoparticles to volumetrically absorb concentrated solar irradiation reflected from a heliostat field and efficiently carry this energy to an external combustion process. The solar receiver is modeled and simulated using a combination of Fluent for the fluid dynamics and temperature calculation, as well as an externally coupled Monte-Carlo Ray Trace (MCRT) FORTRAN application, used to calculate a source term representing radiation. This presentation will examine the fluid dynamics and heat transfer effects inside the receiver body to provide an effective receiver design.

Previous research, in which the inlet of the receiver is located on the opposite side of the window, results in inefficient flow into the central outlet tube when gravity effects are introduced. Gravity effects cause the heated fluid near the window surface to rise upward, disrupting the optimal flow into the outlet tube. The reason for this seems to be that the fluid is not able to maintain sufficient velocity to overcome the buoyancy forces introduced by heating the fluid so quickly.

The new receiver design changes allow the inlet to be located on the front of the receiver. In addition, by altering the inlet channel size, the inlet velocity is maintained near the window surface, where the most heating occurs. By moving the inlet, the overall size of the receiver was significantly reduced, allowing for more efficient flow.

The analysis examines the cold-flow fluid dynamics of the receiver for several sizes and shapes. After qualitatively determining the receiver with the best flow conditions, we are able to provide a quantitative analysis of the efficiency and temperature mapping inside the receiver during operation.

295 9:30 am
The Monte Carlo Method To The Discrete Ordinates Methods In Fluent For Calculating Radiation Heat Transfer In A Small Particle Receiver
Eugene Cho, Mechanical Engineering (M)
Fletcher Miller, Mechanical Engineering

The Combustion and Solar Energy Laboratory (C&SEL) at San Diego State University is developing a Small Particle Heat Exchange Receiver (SPHER) to absorb and transfer heat from concentrated solar radiation to a working fluid for a gas turbine. The SPHER is to be used with a Concentrated Solar Power (CSP) system where a heliostat field highly concentrates solar radiation on the optical aperture of the SPHER. This research focuses on comparing a Computational Fluid Dynamics (CFD) model using the ANSYS FLUENT Discrete Ordinates (DO) Model and a program developed by the C&SEL which uses a Monte Carlo Ray Trace (MCRT) method to calculate the spatial and directional distribution of radiation.

Previous research at the C&SEL has shown successful implementation of the MCRT method to calculate the spatial and directional distribution of radiation. The MCRT method is highly accurate. However, the MCRT code takes several days to run, is inflexible to geometry changes, and is cumbersome to implement as the MCRT code needs to be rewritten for each new receiver geometry. These factors necessitate the need to find an alternate method that accurately calculates the spatial and directional distribution of radiation for a solar receiver and can be efficiently implemented for various receiver geometries.

The DO method is a new method for solving the Radiative Transport Equations (RTE) using a FORTRAN program, developed by the C&SEL, and the ANSYS FLUENT DO model for calculating the RTE. The FORTRAN program calculates the proper inlet radiation boundary conditions that ANSYS FLUENT uses for calculating the RTE.

The main focus of this research is to compare two different methods for solving the RTE within the idealized SPHER. The solution data for several cases using the previous coupled MCRT method and the ANSYS FLUENT DO model is presented for both a collimated and diffuse gray radiation approximation. The case studies focus on comparing critical receiver parameters such as the mean outlet temperature, wall temperature profile, outlet tube temperature profile, and total receiver efficiency while keeping the total inlet radiation flux of 5 MW and inlet mass flow rate of 5 kg/s constant.

296 9:45 am
Comparison of Flame Spread over Thick Polymethylmethacrylate Sheets in Narrow Channel Apparatus and a Microgravity Environment
Tirthesh Shah, Mechanical Engineering (M)
Fletcher Miller, Mechanical Engineering

The NASA Burning and Suppression of Solids-II (BASS II) experiment examines the combustion of different solid materials and geometries in microgravity. The Bass II results will be used in comparison with ground based experimental setups aimed at replacing NASA’s current test method for screening materials used onboard spacecraft.
Flame spread tests were conducted over thermally thick Polymethylmethacrylate (PMMA) samples in the San Diego State University Narrow Channel Apparatus (SDSU NCA). The Narrow Channel Apparatus (NCA) can suppress buoyant flow in horizontally spreading flames, and is currently being investigated as a possible replacement or complement to NASA’s current material flammability test standard, NASA-STD-(I)-6001B Test 1. The buoyant suppression attained in the NCA allows tests to be conducted in a simulated microgravity environment—a characteristic that NASA’s Test 1 lacks since flames present in Test 1 are driven by buoyant flows. The SDSU NCA allows for tests to be conducted at various opposed flow oxidizer velocities, oxygen percentage by volume, total pressure and gap heights.

The current tests conducted in Narrow Channel are on samples 3 and 5 mm thick with the oxygen concentration ranging from 20.0 to 22.5%. Different opposed flow velocities have been tested. The test conditions were matched to the BASS II experiments. A camera placed on top records the entire test. Then using Spotlight-16 image tracking software we obtain position vs time graphs and get the flame spread rate to compare the results.

297 10:00 am

**Penetrating GC-MEMS Electrode Array Fabrication for Coupled Electrophysiological signal and Neurotransmitter Detection**

Mieko Hirabayashi, Bioengineering (D)
Sam Kassegne, Mechanical Engineering

Currently spinal cord injury is a very real problem for many people. When the spinal cord is injured in a fall, car accident, or any other physical trauma, the recovery that the patient will make is unknown. Some patients learn to walk again with no problem, while other are sentenced to life in a wheelchair or to a life of chronic pain. There are some treatments that currently exist such as physical therapy and spinal cord stimulation, but the wide variety of the results in treatment are mostly due to a lack of understanding in how the spinal cord is repairing itself. Thus, the research to be presented is centered around the development of a spinal cord microelectrode array designed for in vivo implant in the rat spinal cord that can stimulate neurons and then detect neurotransmitter signals in addition to electrophysiological signals. The ability to couple the two signals may allow for the disambiguation of processes following stimulation that has been shown to induce neuroplasticity. Preliminary results show that the glassy carbon used can detect serotonin in vitro using fast scan cyclic voltammetry and detect electrophysiological signals in vivo.

298 10:15 am

**Power ultrasound treatment of microalgae for energy generation and growth media effects on performance**

Rory Klinger, Environmental Engineering (D)
Temesgen Garoma, Civil, Construction and Environmental Engineering

The use of biological fuels is a promising approach to decrease the net carbon intensity of energy generation (kgC/MJ). One of the approaches to integrating biological materials into existing generation processes is the supplementation of anaerobic digestion reactors with microalgae biomass. In order to maximize the potential of such supplementation, it is thought that the contents of the algae cells must be solubilized. This can be accomplished with pretreatment of the algae biomass. Pretreatment entails energy usage, and so adds a negative term to the net energy of the process. This effect on net energy can be captured with an analysis of energy return on investment (EROI). This work applies power ultrasonic treatment to Chlorella vulgaris grown in Bold’s, TAP, Bristol’s, Sueoka, and HamGM minimal media, and MiracleGro All Purpose Plant Food aqueous solution. Pretreatment induced changes in solution parameters (chemical oxygen demand, soluble chemical oxygen demand, pH, oxidation-reduction potential, electrical conductivity, cell concentration, cell viability, total solids, and volatile solids) are quantified and used to derive EROI from calorimetrically measured energy input and methane potentials. These measured values are then extrapolated for increased levels of ultrasonic treatment and validated with Chlorella vulgaris grown in Bold’s basal medium. Based on the results of this analysis, the viability of power ultrasound for this application is determined, its performance characterized, and required improvements quantified. By comparing the results obtained from growth in various media, inferences are also made regarding media effects on cell strength and energy density of solubilized cell materials.
ABSTRACTS

Session I-3
Oral Presentation:

Binge Eating & Juvenile Health

Saturday, March 5, 2016, 9:00 am
Location: Tehuano

299 9:00 am

Full Plate and Full Bed? Sexuality of Undergraduate Binge Eaters

Dyane Acosta, Psychology (U)
Dr. Elizabeth Cordero, Psychology

Eating and having sex are human behaviors that impact physical and psychological health as well as quality of life. Much is unknown about the sexuality of people who struggle with binge-eating. In a recent review (Cordero, 2013), it was noted that there is a dearth of knowledge about the sexual self-concept of women with binge-eating disorder. Far less is known about men who binge eat. It is particularly important to study these phenomena within the undergraduate population because undergraduates are often emerging adults who are experiencing more independence around their eating and sex-related choices than they typically have previously in their lives. Although the rise of binge-eating has been documented within the undergraduate population (White et al., 2011), it has been rarely studied in conjunction with sexual attitudes and behaviors. The purpose of this exploratory study is to explore the relationships between binge-eating and various facets of sexuality among an undergraduate population.

Participants were 402 college students (292 women). Participants completed the Binge Eating Scale (BES; Gormally et al., 1982) and the Multidimensional Sexual Self-Concept Questionnaire (MSSCQ; Snell, 1998) online. A one-way multivariate analysis of variance (MANOVA) compared binge eaters (n = 60) and non-binge eaters (n = 331) on the twenty MSSCQ subscales. The MANOVA was significant, Wilks’ Λ = .91, F(20, 370) = 1.94, p = .01. Follow-up analyses of variance (ANOVAs) revealed that binge eaters reported significantly higher levels of sexual anxiety, sexual preoccupation, sexual motivation, power-other sexual control, and sexual depression; binge eaters reported significantly lower levels of motivation to avoid risky sex and sexual optimism. Correlational analyses uncovered significant relationships between BES scores and these subscales, along with positive correlations between BES scores and chance/luck sexual control, sexual monitoring, and fear of sex. A negative correlation was found between BES scores and sexual problem prevention. Analyses of women’s data found similar results, with additional findings that included binge eaters (n = 51) reporting higher chance/luck sexual control, BES’ positive relationships with problem self-blame and sexual motivation, and BES’ negative relationship with sexual self-esteem. Implications, limitations, and future directions are discussed.

300 9:15 am


Lauren Dial, Psychology (U)
Elizabeth Cordero, Psychology, IVC

Binge eating—the consumption of large quantities of food in a short amount of time—has been observed in both college men and women. Individuals who binge eat often report loss of control and may adopt a negative body image (Kelly-Weeder et al., 2012; Cordero, 2013). Negative body attitudes are associated with negative sexual adjustment; additionally, sexual self-adjustment’s relationship with sexual self-schemata is mediated by sexual self-efficacy (Reissing et al., 2005). However, little to no research has examined sexual self-efficacy and sexual self-schemata in women and men who binge eat. This study aims to understand the relationship between binge eating, sexual self-efficacy, and sexual self-schemata among college men and women. It is hypothesized that sexual self-efficacy will mediate the relationship between binge eating and sexual self-schemata. Participants were 402 college students from a public university in southern California. Participants completed the Binge Eating Scale (BES; Gormally et al., 1982) and the Multidimensional Sexual Self-Concept Questionnaire (MSSCQ; Snell, 1998) online and received course credit for participation. Total BES scores and means from the MSQ’s sexual self-schemata and sexual self-efficacy subscales were used in analyses. Sixty participants had BES scores that indicated at least moderate levels of binge eating; these participants were categorized as “binge eaters.” A regression model, with binge eating entered as the predictor and sexual self-schemata entered as the criterion, was not significant, R² = .004, F(1, 392) = 1.41, p = .24; thus planned mediation analyses were not conducted. The lack of a significant model with these two variables was observed when analyzing data solely from the participants categorized as binge eaters, as well, R² = .010, F(1, 58) = 0.61, p = .44. Moreover, binge eating was not significantly correlated with sexual self-efficacy in the entire sample (r = -.03, p = .26), or in the binge-eaters group (r = -.07, p = .31). Sexual self-efficacy and sexual self-schemata were positively correlated in the entire sample (r = .51, p = .01) and in the binge-eaters group (r = .50, p = .01). Implications, limitations, and future directions will be discussed.
### 301 9:30 am

**Changing Mental Health Characteristics of the Juvenile Justice Population**

Rachel Ruiz, Social Work (M)
Melinda Hohman, Social Work

**Hypothesis:** In California, legislation since 2009 has diverted more non-serious and nonviolent offenders away from the juvenile justice system. San Diego has seen a drastic decrease in the detained juvenile population. This calls for necessary examination of the changing mental health needs for the population that remains today. Using the MAYSI-2, a mental health screener completed by minors when entering detention, this study examined mental health characteristics on six subscales: Alcohol/Drug Use, Angry-Irritable, Depressed-Anxious, Somatic Complaints, Suicide Ideation, Thought Disturbance, and Traumatic Experiences. The hypothesis is that this study will observe higher clinical elevations on the MAYSI-2 in the current juvenile population (cohort 3) than previous cohorts, due to diversion of less serious and nonviolent offenders from the system. **Method:** The current study used secondary data provided by San Diego Probation from the juvenile detention facility. Participants were male and female, ages 12–17. The total sample (N = 7437) was divided into three Cohorts based on key legislation: SB 1449 regarding marijuana possession, SB 1296 banning incarceration of truants and Proposition 47 reducing some non-violent crimes from felonies to misdemeanors. A logistic regression analysis was conducted to predict “Warning” cutoff scores for each cohort. Generally, about 10% of youth score “Warning” on all subscales. **Results:** There was a statistically significant decrease in likelihood to score Alcohol/Drug Use warning from Cohort 3 to Cohort 1. Thought Disturbance had a statistically significant decrease comparing Cohort 3 and Cohort 2 to Cohort 1. Suicide Ideation has a statistically significant increase in likelihood to score warning, comparing Cohort 3 and Cohort 2 to Cohort 1. Females scored higher on all scales, consistent with previous research findings. Black/African Americans were least likely of all races/ethnicities to score higher on Alcohol/Drug Use. Hispanic respondents were least likely to score higher on Suicide Ideation. **Conclusion:** According to results, our hypothesis of higher scores was true only for Suicide Ideation. Alternatively, the decrease in likelihood of warning levels on Alcohol/Drug Use and Thought Disturbance reveal a potential correlation between changes in alcohol/drug-related sentencing and the juvenile population. Other subscales were not significant so the null hypothesis was accepted.

### 302 9:45 am

**Differential Response To Delinquency Commission Based On Socioeconomic Status: The Pathway To White-Collar Crime?**

Elliott Alvarado, Criminology and Criminal Justice (M)
Stuart Henry, Public Affairs

The Center for Disease Control and Prevention (CDC) addresses certain factors that may contribute to youth’s risk of engaging in school violence. These factors include, pre-existing history of violence, substance use/abuse (i.e. alcohol, drugs), interaction with delinquent social groups, weakened family bond, poor academic performance, and living in a low income community (CDC, 2012). However, violence and peer aggression are not evenly distributed across socio-economic, racial or ethnic groups. Among different social groups there appear to be different types of violence committed. By analyzing pre-existing data on causal factors of delinquency and through the application of an integrative theoretical model of labeling/interactionist, life course, neutralization, and desistance theory, the proposed research would investigate whether or not there is a differential response for school delinquency commission from school administrators based on the student’s socioeconomic status. This study hypothesizes that low SES students experiencing differential response and harsher, more exclusionary punishment are more likely to become career criminals and end up in the criminal justice system. Perhaps more importantly, students with high SES who don’t experience consequences for delinquency in schools encourages/gives license to future delinquency and results in possible future involvement in white-collar crime.

### 303 10:00 am

**Validity and Reliability of the IES-2 in Valorando Nuestros Cuerpos: An Intuitive Eating Intervention for Latinas**

Jessica Hawks, Public Health (D)
Hala Madanat, Graduate School of Public Health

Latina women in the US have the second-highest prevalence of overweight and obesity (77.2%) after non-Hispanic black women (82%) (Ogden, Carroll, Kit, & Flegal, 2014). Mexican-American women also have a high prevalence obesity-related illness, including high cholesterol and type 2 diabetes (Daviglus, Pirzada, & Talavera, 2014). Research suggests that intuitive eating, a way of eating that focuses on body acceptance and eating due to biological hunger, may be an effective weight management tool. This paper aimed to provide further evidence of validity and reliability of the Spanish version of the Intuitive Eating Scale-2 (IES-2) and to explore the appropriateness of intuitive eating constructs in the Latina population in San Diego.
This secondary data analysis used data from 54 Latina women who participated in a 10-week intuitive eating intervention, Valorando Nuestros Cuerpos (VNC). Descriptive statistics were calculated for all variables using SPSS for Windows, Version 22. Cronbach’s alpha and inter-item correlations were calculated as a measure of internal consistency. A repeated measures ANOVA \((\alpha=0.05\) using a Bonferroni correction) was used to examine changes in intuitive eating, BMI, waist circumference, blood pressure, fat intake, depression, self-esteem, sleep quality, and acculturation at baseline, three months (immediately post-intervention), and six months.

Cronbach’s alpha was calculated for the intuitive eating scale at baseline \((\alpha=0.805)\), three months \((\alpha=0.800)\), and six months \((\alpha=0.828)\), indicating acceptable internal consistency at each time point. Intuitive eating scores improved over time, with significant increases between baseline, 3, and 6 months \((p<0.01)\). With the exception of BMI, which remained stable, other outcome measures moved in the desired direction from baseline to six months, although only the increase in self-esteem \((p<0.01)\) was significant at six months.

This study has provided additional evidence for reliability and validity of the IES-2 among Latinas in San Diego. It also provides preliminary evidence for the feasibility of a 10-week group intuitive eating intervention in this population. Future studies should examine the relationship between intuitive eating and physical activity. In addition, future intuitive eating intervention studies should include a larger sample size and a control group to make greater causal inference possible.

**304**  10:15 am  
*Early obesity onset and its relationship to cardiovascular risk in adolescence: A longitudinal study of a Chilean cohort*

Lorena Pacheco, Public Health Epidemiology (D)  
Richard Shaffer, Public Health

Childhood and adolescent obesity has increased globally. Analogous, and alarming, is the presence of metabolic syndrome (MetS), an adult-onset cardio-metabolic disorder and risk factor for cardiovascular disease (CVD), in the pediatric population. It is known that obesity tracks from childhood into adulthood, yet the impact of age of onset of obesity on health outcomes, including CVD, is unclear. Studying MetS in adolescence can steer prevention approaches to help avert CVD risk. The primary aim of this study is to examine the association of early obesity onset \((<5\) years of age) and CVD risk in adolescence, in a cohort of low to middle class Chilean participants followed since infancy.

The study population included \((N=673)\) participants who were assessed at three time points: 1y, 5y, and adolescence \((\text{mean age 16y})\). Adiposity was assessed at all times points, while blood pressure and fasting blood samples measured at late adolescence. Early obesity onset dichotomized (yes/no) and defined as: obese at 1 or 5y. A MetS z-score was computed to analyze the CVD risk outcome as a continuous measure. Multiple linear regression (MLR) was used to examine association. Among study population, 23\% had early obesity onset, and 41.3\% of those were obese in adolescence. Participants with early obesity onset had significantly higher mean MetS z-score in adolescence compared to the no early obesity onset group \((0.4\pm0.7 \text{ vs } -0.1\pm0.5, p<0.0001)\). In the adjusted MLR model, early obesity onset contributed to a 0.14 \((\text{SE 0.05})\) higher MetS z-score in adolescence, regardless of obesity status at adolescence and controlling for sex \((p=0.004)\). Thirty seven percent of the variance was explained by the model. Results suggest that adolescence CVD risk relates to early obesity onset. Findings contribute to a growing body of work supporting the need for early detection and intervention of childhood obesity.

Session I-4

**Oral Presentation:**  
Migration, Identity, & Higher Education  
Saturday, March 5, 2016, 9:00 am  
Location: Aztlan

**305**  9:00 am  
*Hungry and Homeless*

Jeanette Corona, Chicana and Chicano Studies (U)  
Victoria Gonzalez-Rivera, Chicana and Chicano Studies

The United States’ economic recession of 2007 to 2009 has had long lasting economic impacts affecting many of our public services. Budget cuts to higher education and increases to tuition, for instance, pose a problem to marginalized students; students face the danger of being excluded from the CSU system—a once very well funded public institution. Currently, my research suggests that the homeless and hungry student population is invisible. I will use primary documents to define what someone who is homeless and hungry looks like, provide solutions to addressing the issue on my campus, and will describe why the issue is a moral issue needing urgent attention.
306  9:15 am

Chinese Migration and the Rise of Agribusiness
Andrew Alvarez, Education (U)
Eric Boime, History

The Imperial Valley is one of the major powerhouses of American Agriculture. However there are few research papers or books that talk about the region. There is even less research done on the exploits of the Chinese workers that (along with other minorities) made the Imperial Valley into what it is today. Imperial Valley agriculture was made on the backs of the Chinese workers, but why is there no research done about the subject? Why is there almost no diffusion of Chinese culture in the area? This presentation will argue that Chinese isolationism plays a huge role in the lack of diffusion of culture and lack of research. Using primary and secondary sources from archives along the border, this paper will highlight the importance of the Chinese worker in the development of the region.

307  9:30 am

Motherhood: An Imperative in African Womanhood
Kiedra Taylor, Comparative Literature (U)
Phillip Serrato, English and Comparative Literature

Chinua Achebe’s post-colonial novel, Things Fall Apart, is a story about the making of an Igbo man and provides readers with an illustration of Igbo (Nigerian) customs using a male’s gaze. Although his novel portrays a patriarchal structure, he does not completely ignore the role of women. Readers must consider the fact that Achebe’s male perspective is limited because he is not a woman. Much of the conversations, thoughts, and emotions that Igbo women have are incomplete in Achebe’s work. Similarly, the preview of Ngugi wa Thiong’o’s novel, Weep Not, Child, claims to be an illustration of a family who is “deciding where their loyalties lie,” yet the plot seems to be dominated by the male characters. Emecheta’s novel, The Joys of Motherhood, however, provides more insight into the lives of African women and emphasizes the role of motherhood as an imperative to becoming a woman. This idea is echoed in Flora Nwapa’s novel, Efuru. It is, therefore, this ground that this paper will be anchored on to provide a juxtaposition of the role of motherhood for African women in literature.

308  9:45 am

Afro-Mexico: Negotiating a Cultural Identity through Dance
Joana Guzman, History (M)
Eric Boime, History

This research looks at the cultural performances and popular celebrations practiced by Afro-Mexicans from the colonial period to the 20th century in the regions of Veracruz, Oaxaca and Guerrero. The goal is to demonstrate how the use of performance and popular traditions has impacted Afro-Mexicans in the shaping of an imagined community, giving space for agency in the formation of their cultural identity. The scholarship of the African diaspora in Mexico is a relatively fresh area of study. Gonzalo Aguirre Beltran (1945) pioneered the documentation of their economic history including slavery and origins. Other themes of study rely on sociopolitical aspects, geographic studies, gender, magic and spirituality. The work of Humberto Aguirre Tinoco (1983) and Anita Gonzales (2004) have explored dances and colonial folksongs to evaluate the contributions of Afro-descendants in the formation of what is considered today’s Mexican culture. This research uses a multidisciplinary approach of various fields including cultural anthropology, history and cultural studies. Primary sources such as Inquisition documents obtained from the national archives of Mexico City describe the restrictions placed to restrain the active participations of Afro-Mexicans in street singing and dancing. Written and visual ethnographies trace the popular dances performed in the Black communities of aforementioned regions. The dances witnessed involved the jarocho, zapateado, Toro de Petate and other popular dances of the areas. Overall, it is not accurate to say that Mexico denies its black presence and history, but it would be more assertive to say it neglects it. Mexico’s constitution does not recognize afro descendants as an ethnic group. Mexicans in general are unaware of the contributions that Afro-descendants have given to enrich Mexican culture. It is common to find people outside these regions who do not even know their presence exists and that Mexico once had a large population of enslaved Africans. All these factors have a general repercussion in their cultural identity and their history remains subjugated knowledge. Therefore the study on Afro-Mexican use of dance and folk song to manifest, express, and/or negotiate their identity is a contribution to the emerging field in history.
ABSTRACTS

STUDENT RESEARCH SYMPOSIUM 2016

309  10:00 am

Intercultural Friendship Formation Between East Asian and Vietnamese International Students in the U.S. and Their Host Nationals
Erika Nakayama, Communication (M)
Perry Pauley, Communication

Previous research demonstrates that international students, particularly East Asians in the U.S., struggle to make host national friends (Gaires, 2012). Almost 50% international students come from East Asia (Institute of International Education, 2015), thus it is important to help them befriend host nationals, which helps international students to adjust to a new environment (Ward & Masgoret, 2004). In order to solve or lessen this issue, this study generated five hypotheses and two research questions regarding six qualities: Level of connection and functions of friendship, language proficiency, perceived homophily, cultural values, self-disclosure, and multicultural personality, employing Identity Management Theory (IMT; Cupach & Imahori, 1993, 2005) as a theoretical framework. These variables will be collected through online survey, which is still in progress. About 200 college students' data will be utilized for the analysis.

310  10:15 am

The University of Ibadan: A Study of Postcolonial Knowledge
Christian Alvarado, History (M)
Eve Kornfeld, History

Upon Nigerian Independence in 1960, the University of Ibadan found itself central to the operations of the both the new nation and the cultural, governmental, and social institutions that embodied it. The main goal of this project is to shed light upon the proliferation, adoption, and adaptation by Nigerian ‘intellectuals’ of Western/European organizations of knowledge in examining a distinctly African society. Doing so allows us to examine Nigerian intellectualism in a new light; by acknowledging the epistemological and intellectual conditioning of Nigerian thinkers, we can better see the way in which formal, organized knowledge influences (and is influenced by) the organization and governmentality of modern states. The examination of this process in Nigeria, and distinctly colonial/postcolonial context, adds another layer of complexity which seeks to address such things as globalization, traditional/modern constructions of gender and sexuality, and the operation of these (and other) types of processes in Africa generally.

At its most basic, the argument of this research is that upon Nigerian decolonization, institutions of knowledge production based upon the European university tradition fundamentally shaped the particular ways in which intellectuals in the country (and, indeed, Africa generally) attempted to organize knowledge regarding modern, postcolonial society. This was a process tied fundamentally to the operations and governmentality of the modern nation-state, yet another European-style institution existent in postcolonial Nigeria. Ultimately, the formal systems and organizations of knowledge brought to Nigerian society by European colonialism were expanded and entrenched after national independence, rather than altered or fundamentally challenged by a radically different, ‘postcolonial’ society.

In undertaking this research, a wide variety of sources coming from a variety of fields will be employed in order to highlight the pervasiveness of the Western order of knowledge in Nigerian intellectual life. A methodical examination of works as diverse as histories of Nigerian universities, novels, and scientific conference records will be conducted in understanding the particular way in which a European organization of knowledge operated within a postcolonial setting. Ultimately, this will allow us to better understand not only the operation of knowledge within Nigeria, but also within Africa and the postcolonial world more generally.

Session I-5

Oral Presentation: Borderlands & Communities
Saturday, March 5, 2016, 9:00 am
Location: Metztli

311  9:00 am

The Influence of Family Roles on Latinas and their Academic Identity
Diana Chagolla, Sociology (U)
Norma Ojeda, Sociology

Research repeatedly demonstrates Latina/os low college enrollment and completion rates at multiple levels of educational attainment. Although this is a complex problem, it is important to focus on how the academic identities and college-going aspirations of Latina/o high school students are influenced by family roles. This study focuses on Latina high school students and examines how Latina students perceive their roles in their families as daughters and second-mother figures to their siblings, while balancing their role as students. This study uses data collected from a larger research project conducted in the Sociology department at San Diego State University during Spring of 2006 that focuses on the family choices and personal growth of young Latina women in transnational communities under the North American Free Trade Agreement (NAFTA). The research was conducted in three high schools located within the San Diego county, and two high schools from Tijuana Baja California. Focus groups of 8–10 participants were arranged according to student’s high school academic standing (Freshman, Sophomore,
Junior and Senior). The information analyzed in this study will only include data gathered from two focus groups in Sweetwater High School located in the city of National City within the San Diego County. The focus of my analysis is on the student’s responses regarding their educational experiences in high school, their academic aspirations, and how their family influenced these aspirations. Findings illustrated the following ways in which family was described as an influence to the academic identity of the students: prioritizing home/family responsibilities over educational responsibilities, family as a motivation to attend college and not wanting to separate completely from family after high school. The findings demonstrated that although parents and family members encourage the pursuit of an education, family members, culture and economic status all contribute to the enforcement of the functional role Latina daughters have within their family as second mothers to their siblings and as responsible of the household obligations while parents are working. This study will analyze how Latina students perceive such responsibilities and how such responsibilities influence their aspiring plans after high school.

312  9:15 am

Anxiety Disorders and Cultural Concepts of Distress among Latino Deportees Living in a Border Community in Mexico

Juan Peña, Psychology (U)
Elizabeth Klonoff, Psychology

Deportation is a distressing event for many individuals and their families living in the U.S. Studies have shown that following a deportation from the U.S., deportees arriving in Mexico reported significant symptoms of mental and emotional distress. Given that Latino immigrants and their families comprise a significant proportion of the U.S. population, and that deportation can have significant detrimental effects on well-being, it is important that attention be given to the mental health of Latino deportees. This cross-sectional pilot study had three aims: (1) assess the prevalence of cultural concepts of distress, nervios and ataques de nervios and meeting criteria for an anxiety disorder; (2) identify primary symptoms of anxiety; and (3) examine gender differences in meeting criteria for an anxiety disorder. Methods: Participants (N = 50) were recruited from migrant shelters for deportees in Tijuana, Mexico, where they completed in-person structured clinical interviews. Data collected included, demographic information, migration and deportation history. The EMIC was used to assess nervios and ataques. The MINI was used to assess anxiety disorders. Descriptive statistics were used to assess demographics, migration and deportation history, cultural concepts of distress and meeting criteria for anxiety disorders. Chi-square analyses will be used to explore gender differences in meeting criteria for anxiety disorders.

Results: Nearly all participants were born in Mexico (94%). The mean age was 37 years, and 50% were women. Meeting criteria for an anxiety disorder was common. Specifically, 38% of participants met criteria for agoraphobia, where as 18% met criteria for generalized anxiety disorder. 34% of participants reported suffering from nervios at the time of the interview and 28% reported experiencing an ataque sometime in their life. Significance: Results from this study are valuable to inform subsequent studies on the mental health of Latino deportees. Despite several limitations, results suggest that deportees may be at risk of developing symptoms of anxiety disorders. Furthermore, prevention, intervention and policy efforts are necessary to improve the well-being of this understudied immigrant subgroup.

313  9:30 am

The Minority within the Minority: The Central American Latina Experience

Melanie Sandoval, Psychology (U)
Irene Lara, Women’s Studies

Growing up as a California-born child of two Central American immigrants, I have always been curious to know whether the experiences in my life were unique to just me. The research I have done is very meaningful, not only because it contributes to the growing field of Central American Studies but also because it has been part of healing my sense of identity. As part of a survival tactic, we assimilate not only to American culture but we must also assimilate to the most dominant culture present on the West Coast, Mexican culture. Using the Critical Race and Gender Theory and Chicana/Latina Feminist Theories as my lens of observation and questioning, I hypothesized that the invisibility or better said, erasure of the Central American identity disconnects Central American Latino/as from ourselves because we are expected to be someone that we are not which in turn leaves one unfamiliar with a culture and a place you once were proud of. Not only do we experience double cultural assimilation, but women also face sexism and often times misogynistic comments from the most important and influential women in their lives. So far, I have reviewed the sparse literature that exists on this topic through research databases and scholarly journals. Throughout my research, I discovered the term “Central American-American” which is used to describe the experience of those immigrants in the “new” America. I predicted that this identity term referred to those who are first generation Central Americans, like myself, but the literature explained that it was used to identify the newly arrived Central American immigrants. In this research presentation, I discuss many different aspects of the Central American Latina identity and how these aspects are shaped and in some cases are erased or made invisible. Although the Central American Latina experience might not be unique to just Central American culture, investigating this little studied group can be used as framework and applied in other areas of study relating to identity and the multiplicity of Latinidades in the United States.
Building on these preliminary findings, I plan to specifically analyze the gendered experiences of Central American Latinas. Furthermore, I will develop my research by conducting observations in the community and during events held by feminist organizations, as well as conduct interviews with participants who are willing to share their story, asking them about their experience as Central American Latinas who are willing to share their story. For my specific research, conducting interviews and observing are the most helpful methods because of the sensitivity of the topic being analyzed. In order to get reliable sources of information, I must carry out these methods.

314 9:45 am
The Effects of Mexican Hometown Associations
Luz Hernandez, Criminal Justice (U)
Shawn Flanigan, Undergraduate Studies

Hometown associations (HTAs) are organizations that allow immigrants from the same city to maintain ties and support their place of origin. They often send help through supplies, services, and/or remittance. According to the World Bank’s data, in 2015 Mexico received $25 billion in remittance with 97 percent coming from the United States. These Mexican HTAs play a big role in these numbers and often these HTAs have a considerable impact in their hometowns. In this case study, I analyze a Mexican hometown association based in Los Angeles, California who have organized themselves to send support to their Mexican hometown of Comanja, Michoacán. Through interviews with approximately fifteen members of this association and citizens from the recipient region, I aim to determine the methods in which funds are consistently raised, how funds are being delivered, and what are the sentiments of the residents from the recipient town. My research thus far demonstrates a strong cultural obligation for financial support of family members and the preservation of regional traditions and lifestyle, including remodeling churches and helping families in need. My data suggests that this method is effective in stimulating local economies and making a difference in these resident’s lives.

315 10:00 am
Intergroup Friendships: The Inner Workings of Self-Disclosure in Interracial Relationships
Ashley Weinberg, Psychology (M)
Thierry Devos, Psychology

Previous research has found that self-disclosure between an individual and an outgroup member plays a powerful role in promoting positive outgroup attitudes towards the entire outgroup that the member belongs. Trust, empathy, and anxiety reduction all mediate the relationship between self-disclosure and positive outgroup attitudes. However, the role that these and other mechanisms play for all parties in an interracial relationship is not well-known. We expanded on previous self-disclosure research to analyze both majority—White—and minority—Latina/o—perspectives. We considered the role of an additional mediator as well: race-related self-disclosure. Based on previous research, we predicted that (H1) as self-disclosure within a friendship increases, positive outgroup attitudes also increase. We posited that the relationship between self-disclosure and outgroup attitudes would be mediated by (H2) race-related disclosure, (H3) trust, (H4) empathy, and (H5) anxiety reduction. This means that we predicted an increase in self-disclosure would be associated with an increase in these variables, and therefore, an increase in these variables would be associated with an increase in positive outgroup attitudes. We hypothesized that an increase in (H2) race-related self-disclosure and (H3) trust would be associated with a larger increase in positive outgroup attitudes for Latina/o than Whites/Caucasians. On the other hand, we hypothesized that (H4) empathy, and (H5) anxiety reduction would be associated with a larger increase in positive outgroup attitudes for Whites/Caucasians than Latina/o. As our study used a two-group quasi-experimental design to study Latina/o and White/Caucasian San Diego State University students with respective White/Caucasian and Latina/o outgroup friends. Subjects were recruited through the SDSU psychology department participant pool, and participated by completing an online questionnaire. Preliminary results indicate that self-disclosure is linked to positive outgroup attitudes, and that self-disclosure is mediated in similar ways for both White/Caucasian and Latina/o. Findings also reveal that self-disclosure works separately from race-related self-disclosure, which was not found to have an effect on outgroup attitudes. Our study provides insight into the role and benefits of self-disclosure in interracial interactions.

316 10:15 am
Tensions on The Wall: Discursive Polarization of Houseless Identities
Breanne Acio, Communication (M)
Patricia Geist-Martin, Communication

Houselessness, a more accurate term for homelessness, is highly stigmatized. People who are houseless are often at the receiving end of criminalization, violence, and condemnation. However, the rampant discrimination that these individuals face is often overlooked and underrepresented. This is an ethnographic exploration of The Wall in Ocean Beach, California, which is a popular location for housed and houseless people alike. The findings presented in this research offer an alternative narrative to dominant perceptions of houselessness, as well as illuminate the polarized identities constructed through public discourse, and the implications those discourses have on the dynamics between housed and houseless communities. Theoretical implications regarding stigmatization, dominant discourses, and interaction inhibition are discussed.
**Session I-6**

**Oral Presentation:** Ecology & Evolutionary Biology  
**Saturday, March 5, 2016, 9:00 am**  
**Location: Templo Mayor**

### 317 9:00 am

**Historical Isolation and Future Adaptation: Using Evolutionary Genomics to Conserve the Yosemite Toad**  
Paul Maier, Evolutionary Biology (D)  
Andrew Bohonak, Biology

Amphibian conservation in the 21st century is beset by many anthropogenic impacts including habitat alteration, chemical toxicants, pandemic disease, and climate shifts. The Yosemite Toad (*Anaxyrus canorus*) is a species of meadow-specializing amphibian endemic to the “pristine,” high-elevation, and federally protected Sierra Nevada of California, yet approximately 50% of its sites have recently been extirpated. Thus managers have two important goals for managing the species. First, it is important to identify likely environmental drivers of population declines, and barriers to population connectivity. We have previously established that rugged topography, conifer vegetation, human recreation, and climate change impact gene flow between toad meadows. Another essential goal is to identify the spatial scale(s) at which populations are genetically structured. Characterizing gene pool boundaries, sources of diversity, and individuals with high potential for future adaptation to climate change and other stressors are all important steps to guiding interventionist strategies such as reintroductions. Additionally, previous phylogenetic work has suggested a deep species-wide mitochondrial rift inside Yosemite National Park, with unknown location, genomic extent, and fitness consequences. In this study we used double-digest RADseq to produce 1000s of unlinked nuclear SNPs along with Bayesian clustering, multivariate ordination, and estimates of asymmetrical migration to test the hypothesis that toad meadows are largely concordant with gene pool boundaries. Our results revealed hierarchical genetic structure representing both current and ancient processes. We confirmed the presence of an ancient genetic rift and contact zone within Yosemite that shows an interesting pattern of stability and genetic diversity. Separate environmental drivers of gene flow are found on either side of this contact zone. Additionally we found that above the meadow level, clusters of meadows show source-sink dynamics. Larger, flatter meadows have more diversity and incoming gene flow. Our results will have significant utility for prioritizing the future management and conservation of this iconic California native.

### 318 9:15 am

**Genetic Admixture in the San Diego Fairy Shrimp (Branchinecta sandiegonensis)**  
Ketan Patelj, Evolutionary Biology (D)  
Andrew Bohonak, Biology

Because only 3–7% of historically present vernal pool habitat remains in coastal San Diego County, conservation efforts must prioritize both maintenance of these pools and the genetic integrity of their inhabitants. Simovich et al (2013) suggested admixture between the endemic San Diego fairy shrimp (*Branchinecta sandiegonensis*) and the versatile fairy shrimp (*Branchinecta lindahli*). They published a hybrid index based on female dorsolateral spinal patterns (which cannot be used for males and immature individuals). Using morphologically scored females from multiple source populations, we have developed a genomic hybrid index comprised of 23 single nucleotide polymorphisms that are alternatively fixed between the two *Branchinecta* species. This genomic hybrid index can be used to validate the existing morphological hybrid index, detect hybrid individuals, identify admixture in juveniles and males, and estimate natural admixture rates. Genetic assessment San Diego Fairy Shrimp populations and genetic monitoring over time will better inform management and conservation practices in the remaining coastal vernal pool ecosystems.

### 319 9:30 am

**Distinct and stable microbiome structure from the Common thresher shark (Alopias vulpinus)**  
Michael Doane, Ecology (D)  
Elizabeth Dinsdale, Biology

As the health of sharks is inherently linked with emergent properties of the microbiome, determining the structure and stability of the skin microbiome of the shark is critical. The microbiome is influenced by physical and chemical properties imposed by the host. Shark skin is composed of fluid friction reducing dermal denticles and bioactive mucus. In this study, we investigated the community composition of the microbiome associated with the skin surface of the Common Thresher shark (*Alopias vulpinus*). We hypothesized the skin boundary layer of the shark, with its biochemical and biophysical properties, would yield microbial communities distinct from the water column. Microbes were collected from the base of the first dorsal fin of 6 *A. vulpinus* individuals in the California Bight using a “supersucker” method. DNA was processed from the microbes for shot-gun metagenomics and sequenced using Ion Torrent technology. The MG-RAST platform was used to annotate the resulting genomic data, which yielded an average of 936,614 high quality sequences having an average sequence length of 180 base-pairs. Each metagenome yielded an average of 577,797
sequences with protein coding motifs, but only 2.9 to 8.2% matched known protein sequences in the SEED database. The taxonomic composition was more similar within shark samples than to the water column microbial community (PERMANOVA, p < 0.001). Functional composition of microbial communities were also more similar within shark samples than to the water column (PERMANOVA, p < 0.001). Dominant microbial genera, distinguishing the skin microbiome from the water column microbial community included Pseudoalteromonas (total abund. 12.8%; s.d. 11.4; SIMPER 2.3%) and Idiomarina (total abund. 4.2%; s.d. 3.5; SIMPER 1.2%) and enriched specific gene pathways included heavy metal resistance (total abund. 2.2%; s.d. 0.3; SIMPER 3.3%) and iron acquisition (total abund. 2.2%; s.d. 0.2; SIMPER 1.8%). Highly structured, distinct microbial communities on the skin surface of sharks suggest the presence processes that are selective towards microbial associates. The specific microbiome members and gene pathways distinguishing the shark microbiome from the water are likely important to supporting the microbiome structure or are linked to shark health.

320 9:45 am

**Linking diet-mediated performance to patch selection of an omnivorous ladybeetle**

Shelby Rinehart, Ecology (D)
Jeremy Long, Biology

Omnivores should aggregate to habitat patches containing prey and non-prey (plant material) resources that promote their performance. Despite support for this prediction, we lack studies linking omnivore patch selection in the field, to tangible performance benefits. Here we assessed the aggregation patterns of an omnivorous ladybeetle under field conditions to patches varying in prey and non-prey availability. Adult ladybeetles preferentially aggregated to patches containing scale insect prey, regardless of the presence of cordgrass pollen, indicating that scale insects are the preferred food resource for these insects. To assess the impacts of food resources on performance, we reared ladybeetles in the laboratory on several separate diets, tracking a suite of performance metrics. Adult and larval ladybeetle longevity was greatest in mixed diet (scale insects and pollen) and scale insect treatments. Additionally, adult female ladybeetles produced the greatest number of eggs in all diets containing scale insects. These findings indicate that a diet containing scale insects promotes the performance of multiple ladybeetle life stages. Overall, adult ladybeetles appear to be preferentially aggregating to habitat patches that enhance their reproductive output, personal longevity, and the longevity of their offspring.

321 10:00 am

**Do Microbial Communities Control Emissions of the Greenhouse Gas Methane in Arctic Soils?**

Robert Wagner, Ecology (D)
David Lipson, Biology

Near surface atmospheric warming in Arctic regions is occurring at a rate that is approximately double that of the global mean. Temperatures in the Arctic are expected to continue to rise at a substantially higher rate than the rest of the planet during the next century. As temperatures rise, the depth to which seasonally frozen soils thaw each summer (permafrost thaw) will increase, making previously sequestered carbon stores bio-available. Deeper thaw will also increase soil water content, expanding the available habitat of anaerobic microbial communities, particularly the methanogens. Methanogens produce the potent greenhouse gas methane (CH$_4$), which has a baseline global warming potential that is 28 times that of carbon dioxide on a one hundred year timescale. A potential positive feedback exists whereby CH$_4$ emissions from natural systems are increased by a warming climate and vice versa. My hypothesis is that microbial community structure mediates CH$_4$ production in Arctic soils. Research that I have done thus far has shown that proportional abundances of methanogens correlate with methane production rates in laboratory incubations. This pattern occurs across three distinct field sites in the Arctic, comprising a latitudinal transect spanning the Alaskan North Slope. Additionally, not only the proportional abundance, but the structure (distribution of individual taxa) of the microbial community is predictive of soil methane production. The next step will be to verify, beyond correlation, if microbial community structure controls CH$_4$ production under experimental conditions. This will be done by artificially modifying microbial diversity in laboratory incubations, measuring methane production and comparing results to unmodified incubations. The results of this research will help us to better understand soil-atmosphere CH$_4$ dynamics from a microbial ecology perspective, and will be critical for better predicting the effects of Arctic CH$_4$ emissions on the global climate system.
Metagenomic Investigation of the Viruses of Marine Kelp
Douglas Beattie, Biology (D)
Elizabeth Dinsdale, Biology

Ecklonia radiata is a large brown alga that is a primary habitat former in the temperate rocky coastlines of Australia, and many regions in the southern hemisphere. Ongoing diebacks and disease in E. radiata and other seaweeds around the coast of Australia have raised concern over the long-term health of these ecosystems, and associated economic and commercial endeavors. Disease in marine ecosystems across the globe is on the rise, and a substantial number of disease outbreaks in marine ecosystems are associated with pathogenic microbes and viruses. However, most pathogenic microbes and viruses that have been described are of medical or agricultural importance and not from the natural environment. This is due to the difficulties in characterizing novel microbes and viruses, which has required isolating and cultivating the microbe of interest. In contrast, Next Generation DNA Sequencing (NGS) can provide sequence data from genomes collected directly from the environment without culturing. Metagenomic studies investigate genetic “snapshots” of the microbial community to identify functional genes and taxa within these communities, and facilitate ecological comparisons.

We investigate the role of viruses in disease of E. radiata by comparing the viromes of healthy and diseased kelp, in two locations on the metropolitan Sydney coast. Many sequences of unknown origin and function were detected, in addition to sequences showing similarity to the family Phycodnaviridae (dsDNA viruses), which are known to infect unicellular algae and macroalgae. Also detected were plant-associated viruses of the family Caulimoviridae (RT-dsDNA viruses); and Mimiviridae (large nucleocytoplasmic DNA viruses, as are Phycodnaviridae). This annotation of the sequences assists in identifying potential genomes of novel viruses from assembled data. The taxonomic assemblage was not significantly different between viromes, but the profiles of metabolic functions showed significant variation, suggesting that viruses are typically associated with kelp but the function of viral genes differ in healthy and diseased hosts. These genes may mediate the symbioses between the kelp and associated microbes within the holobiont, and further characterization of these known and novel virus genes may help elucidate the role of viruses in disease of marine systems.
326  9:45 am

*R. Tuomela's Social Ontology*

Julia Strobel, Philosophy (U)
J. Angelo Corlett, Philosophy

Using Raimo Tuomela’s most recent literature on social ontology, I will discuss the successes and shortcomings of his theses. Through identification of a ‘group’ as a single entity, responsibility on a macro-level may be both morally correct and assertable.

327  10:00 am

*A Modern Look at the Beautiful Life*

Nathaniel Hale, Philosophy (U)
Steve Barbone, Philosophy

I investigate the usefulness of an aesthetic ethics in a modern context. That is, I want to revive the ancient Greek notion that people should live the “beautiful life.” That term—the “beautiful life”—has managed to penetrate popular culture. But most people only understand the concept abstractly. It is difficult to understand how one might judge actions, which make up our lives, aesthetically. How can an act be judged beautiful and thus, ethical? Basically, it’s about creating oneself as a work of art. According to Aristotle in the Nicomachean Ethics, the best life is one where you throw yourself into something completely—whether that something is philosophy, a sport, writing literature or something else. This suggests that doing great work is necessary for a happy life. Happiness requires more than having enough stuff, a family, and a job to pay for it all. While this point is commonsensical it often goes neglected. From the time of Aristotle until now, many have proposed notions of the ‘correct’ ethical life. I would say Aristotle’s work has become antiquated in many areas. So why should we accept his notion of the beautiful life? One might understand this through two modern accounts of what it is to be a human being—more specifically, those of Jean-Paul Sartre and Michel Foucault. Foucault and Sartre both argue that human existence is dynamic. That is, both our minds and bodies are perpetually changing. Where they differ is their account of who creates the change. Sartre bases human existence on the idea of free will. Popularly, “existence precedes essence.” Foucault argues that human existence is a result of power distributed throughout a society, working on people. Humans are created by “disciplines,” such as school training, military training, etc. This means Sartre and Foucault differ on the issue of an aesthetic ethics. Foucault advocates it, Sartre doesn’t. In some ways, Sartre offers a critique of an aesthetic ethics. But Foucault makes a strong case for an aesthetic ethics based on his description of human being.

Student Level: (U)=Undergraduate; (M)=Masters; (D)=Doctoral

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328  9:00 am

*Photometric Observations of Eclipsing Cataclysmic Variables: DW Ursae Majoris and DO Leonis*

Benjamin Kuhn, Astronomy (U)
Allen Shafter, Astronomy

Cataclysmic Variable (CV) star systems are close binary systems that contain a white dwarf primary that accretes mass from a lower mass secondary star. Eclipsing systems offer the opportunity to determine fundamental properties of the binary system. We present high-speed photometric observations of two eclipsing nova-like Cataclysmic Variables (CVs): DW Ursae Majoris and DO Leonis. Observations were taken using San Diego State University’s 40-inch telescope on Mount Laguna in Spring 2015. In order to construct light curves, we employed differential magnitudes of the CVs along with several comparison stars in the field. All observed eclipses were at least one magnitude deep, allowing us to measure accurate mid-eclipse times and update the orbital ephemerides for the two CVs.

329  9:15 am

*Ultraviolet and X-Ray Analysis of Superluminous Supernovae*

Melanie Kae Olaes, Astronomy (U)
Robert Quimby, Astronomy

Superluminous Supernovae (SLSNe) are a part of an emerging class of exceptionally bright supernovae with peak luminosities 100 times brighter than typical stellar explosions. Similar to supernovae, SLSNe are divided into two subclasses: hydrogen poor SLSN-I and hydrogen rich SLSN-II. What separates these high energy events from their less luminous counterparts is the mechanism behind the explosions. The luminosity of these events is far too high to be explained by the normal supernovae scenarios. New models developed to explain SLSNe predict high luminosity X-ray emission at late times. A consistent analysis of incoming SLSNe is essential in order to place constraints on the mechanisms behind these events. In the case of X-ray analysis, determining the statistical significance of an observation can be difficult; only a few photons may be detected from the source over thousands of seconds of integration with a non-zero background. Here we perform X-ray analysis using a Bayesian method of statistical inference for low count rate events. We present the results of ultraviolet and X-ray analysis on three SLSNe: LSQ15abl, ASASSN-15lh, PS15ae.
**Numerical Analysis of the Gravitational Redshift and Mass Quadrupole Moment of Deformed Compact Stars**

Alexis Romero, Physics (U)  
Fridolin Weber, Physics

The goal of this project is to analyze the gravitational redshift and mass quadrupole moment of deformed compact stars. Compact stars, such as neutron stars, are stellar remnants of supernova explosions. In theoretical studies, compact stars are traditionally modeled with the assumption that they are perfect spheres. However, if high magnetic fields are present and/or if the pressure at the core of these stars is non-isotropic, compact stars may be deformed into oblate or prolate spheroids. This project aims to investigate the effect of deformation on the gravitational redshift and quadrupole moment of compact stars. Using a parameterized metric to model non-spherical mass distributions, we derive an expression for the gravitational redshift and quadrupole moment for spherically deformed compact stars. Furthermore, we present numerical solutions for these expressions and analyze their implications on the observable properties of deformed compact stars. This research is Funded by a grant from the National Institute of General Medical Sciences of the National Institutes of Health: SDSU MARC U*STAR 2T34GM008303-26.

**Detailed Modeling of Higher Order Hierarchical Kepler Star Systems**

Joanna Gore, Astronomy (M)  
Jerome Orosz, Astronomy

Most stars have stellar companions (i.e. they exist in double, triple, or higher order configurations). Binary star systems are those which contain two stars. These systems are valued scientifically because they allow for the measurement of fundamental stellar properties such as masses and radii. These properties in turn allow for detailed studies of stellar evolution. The Kepler space telescope has discovered roughly 2900 eclipsing binary stars in its field of view. Various studies have shown that roughly 20% of the Kepler eclipsing binaries contain companions are are most likely triple star systems. We present a preliminary survey of the orbital properties of the tertiary bodies in a sample of thirty triple systems. In addition, a small number of the triple systems show eclipse events due to the third star. We present the results of detailed modeling of two of these systems, and discuss how in some cases these triple systems allow for extremely precise measurements of the fundamental stellar parameters.

**Improved Dynamical Parameters for Transiting Circumbinary Planets**

Pantelis Thomadis, Astronomy (M)  
Jerome Orosz, Astronomy

Launched in 2009, Kepler is a NASA space telescope that has detected over 1,000 planets around other stars. Since the dates of these initial discoveries, a large effort has been made to reanalyze some of these exoplanets with larger datasets and better computational methods. Of particular importance are the so-called circumbinary planets, or exoplanets that orbit more than one star.

Kepler systems 16, 34, 35, and 38 are four of the circumbinary systems discovered by SDSU astronomers. Using a state-of-the-art modeling code, we make the most precise measurements of the physical parameters (mass, radius, etc.) of these systems to date. Our models also include extra physics (such as relativistic effects, precession, and tidal forces) not included in the original analyses. In the case of Kepler-16, we also make use of additional light curve data. We present updated parameters for these four systems, including a preliminary search for additional bodies in the Kepler-16 system.

**Hyperons, Delta Baryons, and Deconfined Quarks in Neutron Star Cores**

William Spinella, Computational Science (D)  
Fridolin Weber, Physics

The recent discovery of pulsars PSR J1614-2230 and PSR J0348+0432, with precisely determined masses approximately twice that of our sun, has put tight constraints on the neutron star equation of state. Large neutron star masses raise difficulties because allowing for the presence of exotic forms of matter in the neutron star core tends to reduce the predicted mass of the given model, a problem known as the “hyperonization puzzle.” One popular solution to this puzzle involves adjusting the strength with which hyperons, particles similar to neutrons and protons that consist of at least one strange quark, interact with the neutron star medium. However, such an adjustment may have a substantial effect on the population of hyperons in the core and allow other high mass particles such as delta baryons to become populated.

In order to determine the nature of matter in the neutron star core and analyze the impact of enhanced hyperon interaction we construct a computational model that is able to account for the...
presence of both baryonic matter (neutrons, protons, hyperons, and delta baryons) and quark matter (quarks deconfined from their host baryon). Our results indicate that enhancing the hyperon-medium interaction pushes the onset of hyperonization to higher densities, allowing for a relatively low density appearance of delta baryons. Further, we find that deconfined quarks may coexist with baryonic matter in the cores of relatively high mass neutron stars.

Session J: Oral Presentations

Session J-1

Oral Presentation: Tinker Group 2
Saturday, March 5, 2016, 11:00 am
Location: Pride Suite

334 11:00 am

Education within Brazil’s Landless Workers’ Movement: Validating life and opportunity in the Brazilian countryside

Casey Mellnik, Latin American Studies (M)
Ramona Perez, Anthropology/Latin American Studies

Brazil’s Landless Workers’ Movement (MST) has been operating for over 30 years as one of Latin America’s largest social movements, fighting to reclaim land for small farmers in Brazil’s countryside. A central part of their mission is youth and adult education. My research conducted in Rio Grande do Sul builds on existing scholarship related to MST education, and explores the perspectives of movement educators and administrators on the condition and importance of rural education. Through formal and informal interviews with teachers and administrators as well as participant observation in schools and settlements, my qualitative research identifies theoretical questions related to the value placed on rural space and rural people. Interviewees indicated lack of investment in rural education, lack of professional opportunity, and an institutionalized perspective that the smartest and brightest students will naturally migrate to urban areas while less promising students will remain in rural areas. My research reflects on the movement’s desire to shift and virtually reverse this prevalent perspective of rural devaluation. For the movement, it is not just about expanding opportunities for people, but changing the conversation on how rural space is imagined in Brazil.

335 11:15 am

Preliminary research into creating a feasibility study for an integrated tobacco control intervention within the existing TB and HIV/AIDS treatment programs of a Brazilian Family Health Center.

Erik Hendrickson, Global Health (D)
Thomas Novotny, Public Health

Background: Brazil’s universal healthcare system has Family Health Centers (FHC) with primary care teams that provide comprehensive care to geographically identified communities. These teams seek to integrate care for multiple diseases and to address the social and community determinants of disease and improved health care. There is growing evidence supporting the interactions and causal links between TB, HIV/AIDS, and tobacco use epidemics. Traditional public health approaches to prevent and control diseases often use single isolated programs that do not necessarily address intersections and clustering of diseases among sub-populations that may be at the greatest risk. Using an integrated perspective in the design of integrated health services would help to strengthen prevention and control efforts among infections. Purpose: To conduct preliminary research into creating a feasibility study for an integrated tobacco control intervention within the existing TB and HIV/AIDS treatment programs of a Brazilian FHC. This preliminary research includes identifying international stakeholders, context-specific data and guidelines, dynamics within the local political and economic environments, and the healthcare resources needed for a successful implementation. Findings will ultimately be used in a NIH/NIDA grant submission to conduct a feasibility study that will test the effects of an integrated tobacco, TB, and HIV/AIDS program. This study was intended to serve as a doctoral dissertation for a student in the Joint Doctoral Program in Global Public Health. Methods: Data was collected using participant observation during three weeks of fieldwork practicum experience in Rio de Janeiro, Brazil during July 2015. This research project was funded by the Tinker grant, administered through San Diego State University (SDSU) Center for Latin American Studies. Findings: Preliminary research found amenable international stakeholders and enough healthcare resources to implement a feasibility study, however, the local political environment at the time did not allow for the establishment of the collaborative network needed for the grant proposal. Given the preliminary findings, some strengths of the proposed research consisted of strong relationships with the very active public health community in Brazil. Limitations such as political, cultural, and linguistic barriers slowed progress, but were good learning lessons for being proactive when doing international public health research.
ABSTRACTS
STUDENT RESEARCH SYMPOSIUM 2016
Student Level: (U)=Undergraduate; (M)=Masters; (D)=Doctoral

**336 11:30 am**

*Democracy and Rule of Law in El Salvador*

Andrew Oliver, Latin American Studies (M)
Ramona Perez, Anthropology/Latin American Studies

My research explores the discrepancy between various democracy indices in comparison to national surveys concerning the nation of El Salvador. Research was conducted in San Salvador, El Salvador in August of 2015. Preceding my trip to El Salvador, I assessed democracy indices from Transparency International, The Economic Intelligence Unity and Freedom House as well as surveys from El Salvador, Guatemala, Nicaragua and Honduras. Domestic perception of the political climate is noticeably lower in El Salvador when compared to the ratings given by these external institutions. Furthermore, while El Salvador’s neighbors have received lower democracy ratings the citizens of these countries are generally more optimistic towards their government systems. In going to El Salvador, my goal was to uncover how these results may have developed. I studied for two weeks at the Centro de Intercambio y Solidaridad—a center devoted to the promotion of human values and cultural exchange that developed after the signing of El Salvador’s 1992 Peace Accords. I received instruction on past and contemporary political issues as well as education on the country’s political system. Furthermore, I engaged with Salvadoran youth in an effort to explore their views. It is clear that these democracy indices do not accurately convey El Salvador’s weak rule of law and the public security threat that comes from the country’s inability to deal with high levels of gang membership and crime. Furthermore, as opposing political groups have each been in office since the Peace Accords young Salvadorans feel apathy towards a stagnating economy and failure to make progress on halting crime. Upon returning, I have done further research into El Salvador’s crime epidemic as it relates to rule of law.

**337 11:45 am**

*How Policy Can Support Local Community Development Initiatives to Mitigate the Need for Out-Migration*

Deanna Wolf, Public Administration (M)
Ramona Perez, Anthropology/Latin American Studies

The intended purpose of this preliminary research in the Costa Chica region of Oaxaca, Mexico is to explore the ways in which sustainable community level development in migrant sending areas is occurring and how U.S. policies can use local development to mitigate the need for out-migration. An ethnographic field study, specifically in the area of eco-tourism development was conducted; using both formal and informal interviews with leaders, individuals, and local cooperative groups in communities throughout the region. Framed by the perspective of community members, who live the reality of migration and are actively engaging in local community development with the support of remittance resources, the research question becomes: How can U.S. immigration policy be reformed for men and women who participate in cyclical migration with an investment in the future of their local economies back home? Due to the reality of the interconnected, asymmetrical global economy, local development initiatives, such as those in the Costa Chica region of Oaxaca, Mexico, are continually reliant on money flows from migration. An initial step in escaping such entrenched dependence may be to allow exceptions for immigration visas to the United States for those who desire to participate in cyclical migration with the intention of reinvestment into local economic development projects.

**Session J-2**

**Oral Presentation:**

*Identity, Self-Esteem & Stereotypes*

Saturday, March 5, 2016, 11:00 am
Location: Park Boulevard

**338 11:00 am**

*What’s My Age Again? Sample Differences on Perceived (Dis)ability*

Karen Key, Psychology (U)
Allison Vaughn, Psychology

One in four of today’s 20 year-olds will become disabled before they retire. Currently 37 million people between the ages of 18–64 in the United States population (12%) have a disability and of these people, 7% receive government assistance. Research on government assistance indicates that the prospect of such assistance may alter the way one person assesses another’s overall health symptoms. Previous research has largely used either a student or a non-student sample which may not accurately represent the overall population when considered independently of one another. Therefore, the goal of the present study was to test the generalizability of health ratings towards people with a disability by comparing a student sample and a non-student sample. In the present study, a total of 336 participants were recruited from an undergraduate participant pool (SONA) and Amazon’s Mechanical Turk (MTurk). The SONA sample (n=174; 68.6% women; 33.3% Caucasian) averaged 18.9 years of age while the MTurk sample (n=162; 51.6% women; 76% Caucasian) averaged 34.6 years of age. Participants completed an online survey using Qualtrics software for partial course credit (SONA) or monetary compensation (MTurk). Participants were randomly assigned to one of two information conditions: no information (control) or information
that in the United States, individuals who have a disability may be eligible for financial assistance from the government of hundreds or thousands of dollars a month. Both samples read three vignettes about a person with a disability (chronic pain, depression, or cardiovascular disease) and then rated them on multiple dependent variables: perceived limitations, health, blame, friendliness, sincerity, competence, and changeability through effort. All dependent variables varied by disability type and these main effects were qualified by Sample X Dependent variable interactions for all eight dependent variables. Simple effects tests revealed that perceptions of health ratings were overall more positive for MTurkers as they have likely more experience with health challenges than SONA participants, but these varied between disabilities. Results suggest that perceptions of disability and subsequent health are more complex than previously thought and may be significantly influenced by age and life experience. Methodological and theoretical implications are discussed.

339 11:15 am

**Sexual Self-Esteem, Sexual Self-Efficacy, Sexual Assertiveness: A Significant Threesome?**

Martha Martinez, Psychology (U)
Elizabeth Cordero, Psychology (IVC)

Sexual assertiveness is one’s control over his or her sexual facets (Snell, 1998). Sexual assertiveness is negatively related to risk for sexual victimization (Franz et al., 2015). Sexual assertiveness is associated with sexual self-esteem, or the positive aspects of one’s sexuality. Currently, there is no research on the mediating role of sexual self-efficacy, or the ability to deal with one’s sexual desires, on these two variables. It is possible that individuals with high sexual self-esteem have confidence they can meet their needs, resulting in individuals’ decisions to act on these desires with boldness. Therefore, it is hypothesized that sexual self-efficacy mediates the relationship between sexual self-esteem and sexual assertiveness in women and men; these relationships will be explored among ethnic groups, as well.

Participants were 292 women, 109 men, and 1 person of unspecified gender enrolled in a public university in southern California. Participants self-identified as follows: 84 (20.9%) as being of Asian descent; 112 (27.9%) as being of Latino descent, 136 (33.8%) as being of Anglo descent, 11 (2.7%) as being of Black/African American descent; 6 (1.5%) as being of Middle Eastern descent, and 53 (13.2) as Other/Mixed. Participants completed multiple questionnaires online as part of a study of binge eating and sexuality among college students; data from the sexual self-esteem, sexual assertiveness, and sexual self-efficacy subscales of the Multidimensional Sexual Self-Concept Questionnaire (Snell, 1998) were analyzed for this study. Sexual assertiveness was regressed onto sexual self-esteem; this model was significant, $R^2 = .292, F(1, 391) = 161.29, p = .01$. The model was significantly improved with the addition of sexual self-efficacy, $R^2$ change $= .061$, $F$increased $(1, 390) = 36.62, p = .01$. However, both sexual self-efficacy and sexual self-esteem were significant predictors in the second model, thus sexual self-efficacy only partially mediates the relationship between sexual self-esteem and sexual assertiveness. A similar pattern was found when looking solely among women, men, Latinos, and Anglos. However, sexual self-efficacy fully mediated the relationship between sexual self-esteem and sexual assertiveness among participants of Asian descent. Implications, limitations, and future directions will be discussed.

340 11:30 am

**Fashion for Me! Dress Code and the Rise of Middle School Feminism**

Alyson Shapiro, Child and Family Development (M)
Ariel Beermann-Young, Child and Family Development

There is a revolution coming to public schools: the rise of middle school feminism. Students are voicing their distaste for the dress codes of their schools in ways that were previously unheard of (Driscoll, 2013; Raby 2009). The goal of the proposed thesis is to implement and test an intervention with middle school students and teachers examining the stereotypes in fashion and how it affects the students in what they wear to school. The research question asked is, how do middle school students view the clothes they wear and their school dress codes in comparison to how teachers view student clothing choices? There is a need for research on middle school student’s fashion choices to help students, teachers, and administrators construct a collaborative dress code policy that works for both the students and staff. This research study will use a mixed-methods approach. The target populations for this study are: middle school students (ages 12–14) and teachers. This study utilizes a randomized clinical trial design in which classes are randomly assigned to control or experimental groups, and will use a mixed-methods approach to gathering both quantitative and qualitative survey data. Participants will be recruited from at least one classroom (for a class offered multiple times throughout the day) in at least one public middle school, with a range of 20–180 participants. Both the control and experimental groups will take an electronic survey asking about how they view their individual fashion in relation to gender stereotypes and their gender identity, and how they feel their peers and teachers view them. The experimental group will receive a workshop about child fashion choices and feminism, and then will receive a post intervention assessment with the same questions.
Most environments where differences in opinion exist.

should provide further insight into group dynamics relevant in
carry evaluative meaning. Therefore, the results of this study
environments where numerical majorities and minorities inevitably
valence simultaneously allows the opportunity to assess creativity
diminish analytical thinking for a minority, but cause little change
increase defensive effort focused on accuracy. Correspondingly,
and careful processing style for minorities, boosting analytical
in the correctness of their position, thereby inhibiting
the unsupportive parent-child relationship, which influence how
themselves about potential aversiveness of their
minority/minority) X 3 (stereotype valence: positive/negative/
provide little incentive for creative explorations. Correspondingly,
a negative stereotype should cause little change above baseline
causing most creativity, but cause majority creativity to decrease.
Minorities should have higher levels of analytical thought than
positive stereotype should exacerbate this
difference. A negative stereotype should induce a risk-averse
and analytical thinking in situations indicative of real-world
environments where numerical majorities and minorities inevitably
carry evaluative meaning. Therefore, the results of this study
should provide further insight into group dynamics relevant in
most environments where differences in opinion exist.
Thus, identifying the motor neuron population and understanding that they facilitate muscle-driven movements in these animals. Though motor neurons have yet to be identified in planarians, it is hypothesized that these genes are expressed in regions where motor neurons are thought to be located. For example, $\text{nkhx6.1}$ was expressed in distinct cells along the animal’s ventral side and $\text{isl-1}$ was expressed in the central nervous system. To study the function of these genes in planarians, we inhibited the expression of all four factors using RNA interference (RNAi). Thus far, we found that $\text{nkhx6.1}$ RNAi caused planarians to stretch their bodies and have “sticky” tails. In addition, we found that $\text{isl-1}$, which is required for tail regeneration, is also required for planarian locomotion. Following $\text{isl-1}$ RNAi, regenerating heads exhibited inching and twisting motions. These results suggest that loss of $\text{nkhx6.1}$ and $\text{isl-1}$ cause abnormal muscle-driven movements and thus are exciting candidate genes involved in motor neuron specification in planarians. Our next step is to visualize neural defects contributing to the observed RNAi phenotypes by performing fluorescence in situ hybridizations and immunolabelings of known neural markers. Finally, combined with our functional assays, labeling of the transcription factor genes with known neural and muscle markers will contribute to the definitive identification of motor neurons in planarians.

Motor neuron diseases (MNDs) are often devastating illnesses that lead to paralysis and death. Gaining an understanding of how to stimulate regeneration of motor neurons could provide a better avenue to treat MNDs. However, the limited regenerative capacity makes these studies difficult in mammalian models. By contrast, planarians can fully regenerate all cell types from an adult pluripotent stem cell population, including neurons. Though motor neurons have yet to be identified in planarians, it is hypothesized that they facilitate muscle-driven movements in these animals. Thus, identifying the motor neuron population and understanding how new motor neurons are specified in planarians could provide insights into how to promote motor neuron regeneration following injury or disease. We hypothesize that the transcriptional pathway by which motor neurons are specified in planarians is conserved with other organisms. $\text{Hb9}$, $\text{lim3}$, $\text{nkhx6.1}$ and $\text{isl-1}$ are transcription factors known to direct motor neuron differentiation. As a first step, we identified homologues of these genes and characterized their expression patterns in planarians. We found that these genes are expressed in regions where motor neurons are thought to be located. For example, $\text{nkhx6.1}$ was expressed in distinct cells along the animal’s ventral side and $\text{isl-1}$ was expressed in the central nervous system. To study the function of these genes in planarians, we inhibited the expression of all four factors using RNA interference (RNAi). Thus far, we found that $\text{nkhx6.1}$ RNAi caused planarians to stretch their bodies and have “sticky” tails. In addition, we found that $\text{isl-1}$, which is required for tail regeneration, is also required for planarian locomotion. Following $\text{isl-1}$ RNAi, regenerating heads exhibited inching and twisting motions. These results suggest that loss of $\text{nkhx6.1}$ and $\text{isl-1}$ cause abnormal muscle-driven movements and thus are exciting candidate genes involved in motor neuron specification in planarians. Our next step is to visualize neural defects contributing to the observed RNAi phenotypes by performing fluorescence in situ hybridizations and immunolabelings of known neural markers. Finally, combined with our functional assays, labeling of the transcription factor genes with known neural and muscle markers will contribute to the definitive identification of motor neurons in planarians.
diminishes cognitive function. We further found that enhancing astrocyte functioning in the medial prefrontal cortex is sufficient to improve cognitive performance. These findings suggest that astrocytes in the medial prefrontal cortex are more complex than those in the orbitofrontal cortex, and that these more complex astrocytes seem to directly participate in the regulation of cognitive flexibility.

346 11:30 am

**Attenuating Obesity-Induced Striated Muscle Dysfunction with Time-Restricted Feeding**

Jesus Villanueva, Cell and Molecular Biology (M)  
Girish Melkani, Biology

According to an alarming World Health Organization report, an estimated 700 million people worldwide were considered obese in 2015. There is an urgent need to address this alarming public health issue and the related increase in obesity-induced metabolic diseases, including striated muscle disease. The common co-occurrence of obesity and diabetes is referred to as metabolic syndrome (MetS) and is associated with elevated risk for cardiovascular, skeletal muscle and other metabolic diseases. Circadian rhythms coordinate cardiac health via the control of organismal metabolism and sleep. Perturbation of these rhythms is linked with increased risk for cardiovascular, muscle and other metabolic diseases. Both genetic factors and lifestyle (such as excess eating, inadequate fasting and sleep disturbance) can disrupt the circadian clock and trigger onset and progression of MetS. However, the effect of daily eating pattern on metabolism has not been assessed at the molecular and genetic levels. We make effective use of the short lifespan and extensive genetic tools available in the *Drosophila melanogaster* (fruit fly), through our novel time-restricted feeding (TRF) model that delays age-associated cardiac dysfunction without affecting caloric intake and activity (Gill et al. Science, 2015). Our proposed study should prevent/delay cardiac and skeletal muscle dysfunction in Drosophila models of genetic and diet-induced obesity. We have shown that both obesity models demonstrated age-dependent deterioration of striated muscle performance, followed by increased triglyceride levels and compromised insulin sensitivity. Obese flies also showed sleep perturbation similar to that in humans. Interestingly, flies under TRF benefited from attenuated age-associated and obesity-induced cardiac and skeletal muscle deterioration, possibly due to decreased triglyceride levels, increased insulin sensitivity and by maintenance of metabolic homeostasis, possibly due to improved sleep. We have also shown that disruption of circadian rhythm is sufficient to compromise cardiac and skeletal muscle performance possibly by disrupting metabolic homeostasis. We continue to study this model to uncover the molecular basis responsible for the protective function of TRF in attenuating metabolic dysfunction and elucidate the intricate system underlining the biological clock.
348 12:00 pm

Neurocognitive performance of adolescents who were iron deficient in infancy and overweight or obese during adolescence: a test of a two-hit nutritional insults

D. Eastern Kang Sim, Public Health (D)
Maria Zuniga, Social Work

The timing and impact of nutritional insults (i.e., periods of poor nutritional conditions that adversely affect physical health) during critical developmental periods have long been recognized as importance to brain development. During infancy, the insult is most detrimental for those with iron deficiency and iron deficiency anemia (ID/A) due to iron’s essential role in brain-circuit development. Adolescence is another critical period that marks growth and change in the brain, second only to that seen in infancy, and may have lasting effect on cognition. Although the underlying mechanism remains poorly understood, studies suggest that obesity may have detrimental effects on brain plasticity. As nutrients often act synergistically, it is plausible that the occurrence of ID/A in infancy with being overweight/obese (OW/B) in adolescence may have far reaching adverse effects on neurocognitive functioning than that experienced as the results of either condition alone. We hypothesized that adolescents who are exposed to ID/A in infancy and OW/B in adolescence will demonstrate lower levels of neurocognitive functioning than adolescents with either ID/A or OW/B or adolescents with neither of these conditions. We conducted a secondary data analysis from a longitudinal cohort study of Chilean infants who participated in a randomized controlled trial of iron to prevent iron deficiency anemia. The Stroop computerized task (i.e., standard measure of cognitive ability) was assessed for group differences in reaction times and accuracy. Infant iron status was assessed at 6, 12, and 18 months. Adolescent BMI percentile was computed using CDC norms. Marginal means were estimated while adjusting for covariates. Adolescents who had experienced infancy ID/A and adolescent OW/B showed significantly longer reaction times (1021 msec) on the Stroop task compared to adolescents with OW/B alone (931 msec), with ID/A alone (950 msec), or with neither condition (911 msec). The Stroop accuracy scores did not differ between groups. Findings provide evidence that exposure to ID/A and OW/B is associated with slower neurocognitive responsive inhibition, whereas ID/A nor OW/B alone did not alter the performance. We suggest that these nutritional insults during key stages of development may act synergistically to disrupt brain development, resulting in poorer neuro-functional maturation.

349 12:15 pm

Reduced Basal Ganglia And Cerebellum Volumes In Adolescents And Young Adults With FASD

Sarah Inkelas, Psychology (D)
Jennifer Thomas, Psychology

Objective: Neurodevelopment has not been well characterized in adults with fetal alcohol spectrum disorders (FASD). We examined age-related differences in the volume of the cerebellum and basal ganglia across adolescence and young adulthood using a cross-sectional sample of individuals with FASD versus controls. Methods: T1-weighted anatomical MRI images were acquired from subjects age 13–30y who had received an alcohol-related diagnosis (FASD, n=112) and controls (CON, n=55). Volumetric data was obtained for the basal ganglia (caudate, putamen, pallidum, accumbens) and cerebellum (cortex, white matter) using automatic segmentation in FreeSurfer v5.3. These data were analyzed using separate MANCOVAs, with group (CON, FASD) and sex (male, female) as the between-subjects variables, and age as a covariate. Successive models were tested to examine nonlinear effects of age, and all corresponding group by age interactions. Results: The model including the linear effect of age accounted for a significant proportion of variance and was the most parsimonious model, thus this model was retained. No significant group by age interactions were found. Significant main effects of sex (p < .001) were found for both regions, but these became nonsignificant when accounting for ICV (p < .478). Significant main effects of group were found for both the basal ganglia and cerebellum (p < .001). All subregions were smaller in FASD as compared to CON (p < .002). When ICV was added to the model, significant effects of group remained (p < .004). For the FASD group, the putamen (p = .014), caudate (p < .001), and cerebellar white matter (p = .001) were reduced after accounting for ICV. There was a main effect of age in the basal ganglia (p = .002), specifically in the caudate (p = .016) and pallidum (p < .001), as sizes declined with age. There was no significant main effect of age in the cerebellum (p = .188). Conclusion: Compared to controls, adolescents and young adults with FASD had smaller basal ganglia and cerebellum volumes. The caudate, putamen, and cerebellar white matter volumes were disproportionately reduced. There were no differences in the developmental trajectories between groups in this cross-sectional sample. Further evaluation of neurodevelopmental trajectories in FASD is necessary using longitudinal methods and including older ages.
Session J-4
Oral Presentation: Linguistics & Archaeology
Saturday, March 5, 2016, 11:00 am
Location: Aztlan

350  11:00 am
The Mystery at Paradox Valley: The Artifacts of 5MN191
James Turner, Anthropology (M)
Seth Mallios, Anthropology

One of the biggest problems in modern archaeology is the high prevalence of archaeological sites that are excavated without future plans to understand the sites’ inhabitants. Often times when this occurs, the artifacts are improperly stored, and occasionally the documentation is lost. Additionally, the sites and collections themselves may be orphaned—that is, the researcher affiliated with the excavation loses funding, gains a new research direction, or simply dies, leaving the artifacts in a virtual limbo. Archaeological site 5MN191 is a prime example of an orphaned collection currently housed in San Diego State University’s Collection Management laboratory. Located in Paradox Valley in Southwest Colorado, the site has an expansive history—after being discovered in the Woodbury Expedition, it was excavated first in 1924, then with repeated excavations occurring in 1931, 1970, and 1973. The artifacts discussed in this presentation were recovered during the 1970 SDSU-Colorado College joint field school, though the field documentation had been destroyed in a catastrophic flood. A typological analysis of the site’s stone tools and ceramics occurred to establish cultural affiliation, and analysis of the sites bone tools commenced to gain insight into the group’s resource use. An artifact typology was created for both the projectile points and the bone awls present in the collection. This presentation will not only shed light on the inhabitants of the site, but also the patterns of resource use based off of the collected artifacts.

351  11:15 am
A Histological Analysis of a Formative Period Population from Cerro de la Cruz in the lower Rio Verde Valley region of Oaxaca, Mexico
Roberto Vega, Anthropology (M)
Arion Mayes, Anthropology

In bioarchaeology there are various methods used to determine the age, sex, and ancestry of a skeleton from an archaeological setting. These methods are essential to bioarchaeologists as we build a biological profile, as well as, the life history of the individuals. Through Dental Cementum Increment Analysis (DCIA) we can determine age at death and season of death (summer or winter) further enabling us to understand the life patterns of the people we study. This study includes 48 teeth (canines and 1st molars) from 30 individuals from the Late Formative Period (400 bc–150 bc) site of Cerro de la Cruz in the lower Rio Verde Valley of Oaxaca, Mexico. The archaeology of the region suggests that settlement patterns began to shift from nomadic to sedentary by the start of the Formative Period. This change to a sedentary life-style brought new complex social relationships between individuals and between individuals and the geographical space they occupy. In 1988 during the initial excavation (n = 86) individuals were recovered with the majority (n = 76) of individuals being clustered around three regions of the site. Structure 1 contained (n = 49) individuals, the Upper Terrace Wall contained (n = 9), and Structure 8 contained (n = 18) individuals. In testing DCIA with this population we hope to determine the following: 1) if this method can be used to determine age at death and season of death on human remains from this latitude, 2) determine any mortality rate differences within and between each of the three regions, and 3) if there is a relationship between death rates and seasonality. Preliminary data suggests a possible correlation between them.

352  11:30 am
Testing Spatial Relation Comprehension in American Sign Language Users
Chris Brozdowski, Language and Communicative Disorders (D)
Karen Emmorey, Speech, Language and Hearing

American Sign Language (ASL) represents spatial relationships (e.g., left of, behind) with classifier constructions: the hands represent objects and the relative position of the hands indicates the spatial relation between objects. When both the signer and addressee can see the objects, the positions of the signer’s hands map onto the positions of the objects in view. This situation is termed “shared” space, and no perspective-taking is required. In contrast, in “nonspace,” the signer describes the location of non-present objects, and the addressee must mentally transform the signer’s production to understand the utterance. For example, when face-to-face, the signers’ left hand (indicating an object on her left) is actually on the right from the addressee’s perspective. While conversation partners canonically face one another, an addressee can also comprehend a signer who is sitting to the side (e.g., at a 90° angle). In this case, the mental transformation performed by the addressee involves a 90° rotation from what the signer said.

We developed the ASL Spatial Perspective Comprehension Test (ASPCT) to assess comprehension of these spatial constructions. The test crosses type of space (shared, nonspace) and signer orientation (face-to-face, 90°). On each trial, the participant sees a spatial description and chooses one of four pictures
that matches the description. We predicted that comprehending descriptions in shared space would be easier than nonshared space. For orientation, a face-to-face situation is canonical and therefore might be easier than the 90° set up. On the other hand, a 90° transformation might be easier than a 180° one.

Thirty-six deaf ASL signers (mean age = 30.8 years) were given ASPCT. Signers were marginally more accurate with shared space compared to nonshared space descriptions, F(1, 35) = 3.50, p = 0.070. Overall, signers were significantly better in the 90° angled compared to the face-to-face condition, F(1, 35) = 32.34, p < .001. These effects were modulated by a space by orientation interaction, F(1, 35) = 19.01, p < .001. The effect of orientation was stronger in the nonshared space condition, t(35) = -5.994, p < .001, compared to the shared space condition, t(35) = -0.722, p = 0.47. In other words, the signer’s orientation only impacted performance when the addressee must accommodate the signer’s perspective.

353  11:45 am

Visual Perspective-taking Strategies are Mediated Differently by Gender for Deaf Signers and Hearing Nonsigners

Kristen Secora, Language and Communicative Disorders (D)
Karen Emmorey, Speech Language and Hearing Sciences

The ability to adopt another’s perspective, whether visually or cognitively, is essential for navigating social environments. Previous research has suggested that, for hearing nonsigning individuals, social abilities may influence performance on visual-spatial perspective-taking (VSPT) tasks in a social context (Shelton et al., 2012). Further, evidence suggests that use of a social strategy may be limited to female participants (Kessler & Wang, 2012). This link between social and VSPT abilities becomes more complex when the language is a visual-spatial language. Because sign languages are produced in space, each interlocutor has a different visual perspective of the spatial arrangement of the signer’s hands, requiring perspective-taking to reach a common understanding. Evidence from children suggests that deaf children tend to rely on nonsocial perceptual strategies to perform VSPT tasks, but hearing children, like hearing adults, tend to rely on social strategies (Howley & Howe, 2004). It is unknown whether deaf adults approach VSPT tasks nonsocially as suggested by Howley and Howe or whether they approach VSPT tasks like hearing adults who draw on social abilities for VSPT tasks. Further, it is unknown whether gender affects the strategy that deaf signers adopt.

Forty-five hearing nonsigners (32 F) and forty-four deaf signers who acquired American Sign Language prior to age 6 (23 F) performed a nonlinguistic VSPT task in which they identified which perspective of a display corresponded to a target image and completed a social/communication questionnaire. Results for hearing participants showed a significant relationship between social/communication abilities and VSPT performance but only for hearing females (r = -.449, p = .010). Deaf participants showed the opposite trend with only females utilizing a nonsocial strategy (r = +.388, p = .067). Thus, males in both groups seem to use strategies unrelated to social/communication abilities while social/communication abilities differentially affect deaf and hearing females: better social/communication skills facilitate VSPT performance for hearing females (suggesting a social strategy) but interfere with deaf females’ performance (suggesting better performance with nonsocial strategies). Therefore, deaf adult females, like deaf children, seem to rely on nonsocial VSPT strategies.

354  12:00 pm

Towards a clinically viable measure of sentence context usage

Charles Ruby, Audiology (D)
Arthur Boothroyd, Speech Language and Hearing Sciences

The present study investigates the feasibility of creating a clinically viable means to measure individual differences of sentence context usage during auditory speech perception. Two types of sentence were developed in a pilot study: meaningful and nonsense. These sentences were recorded naturally as whole sentences and as isolated words to be concatenated on-line during testing. The meaningful and nonsense sentences were presented to 32 young listeners with normal hearing and the percent words correctly repeated was measured as a function of signal-to-noise ratio (SNR). The noise was steady state and had a speech-shaped spectrum. Half of the participants received naturally produced materials. The other half received concatenated materials. The findings support the following conclusions:

• The approach used allowed for a large collection of scorable items in a relatively short amount of time.
• Listeners were able to use sentence context to increase word recognition in noise.
• Context usage, as expressed by the k-factor (ratio of the logarithms of error probabilities for the two types of sentence), was independent of SNR or stimulus structure (naturally spoken vs. concatenated).
• The magnitude of the context effect was consistent with the results of previously published research using similar materials—a k-factor of approximately 2.0.
• The confidence limits of a single participant’s k-factor were not small enough to permit detection of individual differences of context use in this sample of young normally hearing listeners.
• Modifications of the test material and protocol will be needed in order to measure individual context use with adequate reliability in a reasonably short testing time.
In speech-language pathology, the terms language and speech refer to different, but related, concepts. Disorders related to speech include a range of difficulties that result in errored production of the sounds of a language and can affect approximately 10% of US children. Language disorders involve difficulty with the broader language system or structure (sometimes referred to as grammar), affecting 2–19% of US children (ASHA, 2011). Though speech and language are not identical terms, it is unlikely that they exist independently of one another. Evidence of their interaction can be found where one of these components of the communication system has an effect on the other.

To explore this interaction, we consider two studies examining data from 11 typically-developing Spanish-English bilingual children (ages 4;8–5;6) through connected speech samples and two probes designed to elicit grammatical structures (e.g., walked). These studies examine the morphophonological interface, i.e. the intersection of speech and language, in unimpaired children to better understand how phonology (organization of the speech system) interacts with other aspects of language. This in turn will allow us to develop treatment strategies which could address both types of impairments simultaneously. Both studies target word-final consonants and consonant clusters (e.g. asked, [askt]) where phonological complexity and word-final grammatical morphemes (e.g. past-tense ‘-ed’) coincide.

Study 1 examines the effect of phonological context (i.e. surrounding sounds) on production of the past-tense ‘-ed’ morpheme. Results of Study 1 indicate a significant effect of task type as well as an interaction between preceding and following phonological context. Study 2 expands upon the first study, examining not only past-tense ‘-ed’, but also other word-final morphemes. Further, it addresses the confounding task effect observed in the first study by examining only data from speech samples and establishes a data coding protocol designed to better capture the effect of adjacent segmental features and structural complexity.

The relevance of the observed interaction between speech-sound context and morpheme production is discussed in terms of factors affecting treatment target selection and diagnostic considerations for children with phonological or language impairments as well as co-occurrence of the two.
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352 11:30 am
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Chris Brozdowski, Language and Communicative Disorders (D) Karen Emmorey, Speech, Language and Hearing

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353 11:45 am
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Kristen Secora, Language and Communicative Disorders (D) Karen Emmorey, Speech Language and Hearing Sciences

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354 12:00 pm  
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Charles Ruby, Audiology (D)  
Arthur Boothroyd, Speech Language and Hearing Sciences

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- The confidence limits of a single participant’s $k$-factor were not small enough to permit detection of individual differences of context use in this sample of young normally hearing listeners.
- Modifications of the test material and protocol will be needed in order to measure individual context use with adequate reliability in a reasonably short testing time.

355 12:15 pm  
**Phonological effects on grammatical morpheme accuracy in bilingual children**  
Philip Combiths, Language and Communicative Disorders (D)  
Barlow Jessica, Speech Language and Hearing Sciences

In speech-language pathology, the terms language and speech refer to different, but related, concepts. Disorders related to speech include a range of difficulties that result in errored production of the *sounds* of a language and can affect approximately 10% of US children. Language disorders involve difficulty with the broader language *system* or *structure* (sometimes referred to as *grammar*), affecting 2–19% of US children (ASHA, 2011). Though speech and language are not identical terms, it is unlikely that they exist independently of one another. Evidence of their interaction can be found where one of these components of the communication system has an effect on the other.

To explore this interaction, we consider two studies examining data from 11 typically-developing Spanish-English bilingual children (ages 4;8–5;6) through connected speech samples and two probes designed to elicit grammatical structures (e.g., *walked*). These studies examine the morphophonological interface, i.e. the intersection of speech and language, in unimpaired children to better understand how phonology (organization of the speech system) interacts with other aspects of language. This in turn will allow us to develop treatment strategies which could address both types of impairments simultaneously. Both studies target word-final consonants and consonant clusters (e.g. *asked*, [æskt]) where phonological complexity and word-final grammatical morphemes (e.g. past-tense ‘-ed’) coincide.

Study 1 examines the effect of phonological context (i.e. surrounding sounds) on production of the past-tense ‘-ed’ morpheme. Results of Study 1 indicate a significant effect of task type as well as an interaction between preceding and following phonological context. Study 2 expands upon the first study, examining not only past-tense ‘-ed’, but also other word-final morphemes. Further, it addresses the confounding task effect observed in the first study by examining only data from speech samples and establishes a data coding protocol designed to better capture the effect of adjacent segmental features and structural complexity.

The relevance of the observed interaction between speech-sound context and morpheme production is discussed in terms of factors affecting treatment target selection and diagnostic considerations for children with phonological or language impairments as well as co-occurrence of the two.
Session J-5
Oral Presentation: Interdisciplinary
Saturday, March 5, 2016, 11:00 am
Location: Metztli

356  11:00 am
The Connection and Correlations Between the Early Vice Industry of Mexicali and the Relationship Between the Imperial County and Mexicali
Edgar Bernal Sevilla, History (U)
Eric Boime, History
Abstract: Oftentimes, people studying the history of the Imperial Valley view it in a microcosm and do not consider the events and experiences of the other side of the border. Many do not remember that it was once an imaginary line. I explore how the vice industry in Mexicali, particularly under Colonel Esteban Cantu (1915–1920), serves as a perfect representation of the binational relationship dynamic most common in the Imperial Valley: white capital exploits Mexican laws or cheap labor in order profit. To illustrate this point, I discuss in depth the binationality present at the inception of the Imperial Valley, centralization of the vice industry by Cantu, the white-oriented cabarets and prostitution business in Mexicali, and the political favors that Cantu dished out to white businessmen in order to grow Mexicali.

357  11:15 am
Open source dataset for imaging through atmospheric turbulence.
Nicholas Ferrante, Mathematics (U)
Jerome Gilles, Mathematics

When a photo is taken over a distance while subjected to heat, the scene undergoes distortion due to atmospheric turbulence. Algorithms can be run against a distorted image sequence in order to remove distortion. In order to test effectiveness of a particular algorithm compared to another, it is important to have a set of common image sequences. The purpose of the open source dataset for imaging through atmospheric turbulence is to create a public dataset of images containing geometric distortion. The intent of this dataset is to facilitate both communication within the atmospheric turbulence community and to test efficiency of varying algorithms when applied to distorted images. The dataset contains image sequences of varying degrees of turbulence over multiple backgrounds.

358  11:30 am
Incorporating a New Generation of Novel Sensors in Human Space Flight Applications: Contemporary Challenges and Opportunities
Ahmad Soomro, Statistics/Statistical Computing (U)
Ken Arnold, Electrical and Computer Engineering

Humans have the capability, as logic acknowledging, intelligent entities, to adapt to the vast number of unique and unpredictable scenarios that occur in spaceflight missions; this characteristic makes them a favorable addition to the space exploration and research endeavor. The NASA Astronaut Training Program (ATP) programs individuals and teams to handle application control, technical task performance, experiment handling, and other tasks around and beyond Earth orbit by exposure to intense environmental simulations and training modules. Pre-mission analytics may also be collected to assure participant mission compliance. Human existential maintenance and performance optimality are dependent on a combination of bioecological, sociological, and related factors which we will elicit as a background to provide a context for the importance of use of human sensors in spaceflight environments. Section 1 of our discussion begins with a cross-modal analysis of the diverse sensor human-sensing properties (observational, behavioral, physical) and the various functional capabilities that exist with each of these sensor properties (passive and/or active, wearability, data diversity, physical surveillance). In Section 2, a top down body-region to sensor compatibility analysis is conducted to elicit the wide arsenal of state-of-the-art sensors that are available through commercial business or university innovation. We envision a new generation of novel sensors being incorporated in human spaceflight operations that target the risks outlined by NASA Human Research Program (HRP), in Section 3. Applications such as remote control, telemedicine (including pain management), and mission crew management can be developed using the appropriate sensor or combination of sensors. In Section 4, we establish goals for enhancing human factor support for upcoming missions we elicit challenges (environmental, physiological, computational) and pose questions which may help us take the next steps to assuring the transfer of sensor innovation to the commercial spaceflight market. We conclude by emphasizing the long-term benefits and market implications of research into human sensor technology for spaceflight.
359 11:45 am

**A Bioinformatics Approach to Find Mouse DNA Repeats Significant in Aggressive Colon Cancer**

Nitya Bhaskaran, Microbiology (M)
Kathleen McGuire, Biology

Colorectal cancer (CRC) is a global health issue with a significant racial disparity between African (AA) and Caucasian (CA) Americans. Elevated Microsatellite Alterations at Selected Tetranucleotide Repeats (EMAST) is a biomarker of aggressive CRC. EMAST is driven by inflammation and is characterized by insertions/deletions of tetranucleotide repeats in noncoding DNA. Clinically, EMAST has been found in larger invasive lesions and preliminary data suggest it is more frequent in AA tumors. The lack of an animal model has severely restricted the study of the inflammation associated with EMAST. A major difficulty in identifying an animal model is in finding specific sequences that are likely to be unstable. Our goal in this study was to characterize known human EMAST loci and find potential EMAST sequences in a mouse model of CRC. Published human EMAST sequences were analyzed and the requirements such as repeat length and type were determined. Since flanking sequences are also known to contribute to sequence instability, we used bioinformatic tools to discover new motifs in the flanking 25 nucleotides of human EMAST loci. A python program using these parameters was designed and analyses of the mouse genome revealed mouse sequences that met all the requirements of EMAST loci. These sequences were checked for homology to known human EMAST sequences, and those that showed >90% homology were analyzed further. Mouse sequences that showed previous evidence of instability in different mouse genomes were of most interest, as they have already shown they are unstable, and were chosen for further study. Primers were designed for PCR and sequencing of PCR products from normal mouse tissue confirmed we can amplify the correct sequences. One sequence identified using our novel bioinformatics approach shows instability between different mice, demonstrating it is unstable. We are analyzing other sequences and PCR of tumor and adjacent normal tissue from each mouse is in progress to see if EMAST can be detected. Our python program can be used to discover potential EMAST sequences in other species and has identified tetranucleotide repeats characteristic of EMAST that can be used to study EMAST in a mouse model of CRC.

360 12:00 pm

**Genome Binning to Improve the Quality of Genomes Identified from Metagenomes**

Bhavya Papudeshi, Bioinformatics and Medical Informatics (M)
Elizabeth Dinsdale, Biology

Metagenomics involves sequencing all the microbial genetic material present within an environmental sample. Automatic annotation of the genetic material is now possible with a wide range of tools. My aim is to develop a pipeline to identify sub populations within the metagenome and improve the quality of the individual genomes identified. The pipeline begins by evaluating already assembled sequences called contigs. The quality of the contigs plays an important role in being able to extract more information. These contigs are grouped together based on different factors, such as, GC content, tetranucleotide frequencies, contig length and contig coverage distribution in a process called binning. The bins contain a set of contigs that could belong to a single taxonomic group. The contigs within a bin will be aligned to establish the taxonomy of the bin. In order to test this pipeline, metagenome collected from the sea water exposed to algae species in Abrohlos Bank, Brazil was used. Applying the pipeline, we determined that the SPAdes assembler (25,383 total contigs, longest contig length = 32941bp, N50 = 2031) provided a better assembled of contigs over meta-velvet assembler (759 total contigs, longest contig length = 1174 bp, N50 = 565) for this metagenome. By further applying different binning techniques, a range of 5 to 25 clusters were extracted, which were identified to be Vibrionaceae (3 clusters), Pseudoalteromonadaceae (2 clusters) and Campylobacterales dominant (1 cluster), family level clusters. Refining these clusters by repeating the binning process and alignment techniques leads to identification of novel draft genomes within the environment. Identifying novel draft genomes provides a deeper understanding of the microbial interactions within environment.

361 12:15 pm

**Molecular Dynamics Calculations Performed on a Panel of Ubiquitin-Protein G Variants using the amber 14.**

Aishani Chittoor Prem, Bioinformatics (M)
John Love, Biochemistry

Ubiquitin is a small protein that is found in cellular eukaryotes and is highly conserved with 96% sequence identity between the human and yeast variants. Ubiquitin controls many cellular functions ranging from mitosis, protein degradation, and apoptosis. Signal transduction events are generated when uniquely branched ubiquitin moieties bind various substrates through covalent bond formation with one of seven lysine residue
or the N-terminus. In this work models for ubiquitin tethered to mutants of the β1 domain of streptococcal protein G were generated using the software package Swiss Model™. The peptide sequenced used for each model corresponds to actual protein fusions that were designed, expressed in bacteria, purified, and analyzed previously in the Love Laboratory. Using a suite of programs that contain the Amber 14 force-field, molecular dynamics simulations were performed on these structures and were used to compare and assess their stability/flexibility of the models with respect to specific parameters. The Molecular Dynamics calculations use Newtonian equations of force to simulate the dynamic motion of macromolecules over a finite period of time. These calculations were performed with Amber 14 using explicit modeling of water as well as the Generalized Born model for solvent. The energetic and structural states were recorded over set time periods and analyzed for root mean square deviation (RMSD), which are used to assess the stability/flexibility of the protein variants. The ultimate goal of this project is to use these calculated parameters to study the stability of the protein G variants and assess the ability of the human enzyme Ubiquitin C-terminal Hydrolase (UCH-L3) to cleave the bond between ubiquitin and protein G.

362  12:30 pm
Which Parameters are Important? A Sensitivity Analysis of Nuclear Interactions
Stephanie Lauber, Computational Science (D)
Calvin Johnson, Physics
The importance of a robust theory of atomic nuclei has been recognized since the 1930s with a wide range of applications including behavior of nuclei away from the valley of stability, complex processes in astrophysical environments and energy concerns throughout the world. Until recently, the primary limitation has been computational but through recent advances we are able to probe a wide range of nuclei in a relatively computationally inexpensive way. This presentation will focus on the behavior of nuclei in the sd-shell, which includes Oxygen-16 through Calcium-40.

The most common interaction models for sd-shell nuclei contain a total of 66 parameters which can describe hundreds of nuclear levels. When comparing different sets of parameters, for example either derived from theory or fit to experiment, we gain little insight from comparing individual values; instead we carry out a perturbative sensitivity analysis to identify the most important linear combinations of parameters. This allows us to more succinctly denote the difference between parameters sets. In this talk I present a context for our work as well as preliminary results, implications and direction for future research.

Session J-6
Oral Presentation: Drug Use & Cancer
Saturday, March 5, 2016, 11:00 am
Location: Templo Mayor

363  11:00 am
Drug use by agricultural labor
Humberto Dominguez, Social Science (U)
Eric Boime, History
My research will be based on the issues linked between the use of drugs and the physical demands of agricultural laborers in the fields. I will be using interviews, as well as secondary sources in order to gain insight into this topic that has generated so little scholarship. I will be using specific methods of gathering research which include oral interviews, both formal and informal, as well as showing background information on the cultural community of the Imperial Valley with regards to agriculture and drug use (both illicit and legal).

I am seeking a better understanding of why drugs are used by field laborers in order to perform the intense work that it entails.

364  11:15 am
Drugs Feeding America
Enrique Sanchez, Social Science (U)
Erick Boime, History
People believe that filed work is done by a bunch of Mexican that do it since they are uneducated or can’t really do anything else. Since I have lived in the Imperial Valley where driving to town to town requires driving next to a field I have been exposed to agricultural work all my life. To be honest it viewed it the same way having a father that worked in the fields, and him always telling me “if you don’t want school lets go to the fields”. This completely changed when I actually worked in the fields and was exposed to the back breaking work it really is. I met a lot of people that really had great stories most of them were drug users. This presentation is going to be about the stories of actual filed workers and talking about the drug use how extensive it really is. I will have interviews from former and current drug users telling us the actual story of the people that put the food in America’s dinner table.
ABSTRACTS

STUDENT RESEARCH SYMPOSIUM 2016

Student Level: (U)=Undergraduate; (M)=Masters; (D)=Doctoral

365 11:30 am

**NIH Toolbox Fluid Cognition in Youth with Histories of Heavy Prenatal Alcohol Exposure**

Abigail Gonzalez, Psychology (U)
Eileen Moore, Psychology (D)

Heavy prenatal alcohol exposure can cause birth defects and neurodevelopmental disorders (Glass, Ware, Crocker, Deweese, Coles, et al., 2013). Individuals with heavy prenatal alcohol exposure often show cognitive impairment in several domains, which can include general intellectual ability, processing speed, attention, memory, and executive functioning among others (Glass et al., 2013; Rasmussen, Soleimani, & Pei, 2011). We investigated fluid cognition in children and adolescents with histories of heavy prenatal alcohol exposure (AE, n = 11) as compared to those without such history (CON, n = 11) using a brief assessment tool. It was predicted that the AE group would score significantly lower on tasks measuring aspects of fluid cognition. The NIH Toolbox Cognition Battery was administered to the AE and CON group. Subjects ranged in age from 8 to 17 years (M = 14.28, SD = 2.65) and were individually matched on sex and age. Independent samples t-tests were performed on age-adjusted cognition scores (α level=.05). The AE group had significantly lower fluid cognition composite scores than the CON group (t(20)=-4.2, p <.001). Follow-up tests on the fluid cognition subdomains (Bonferroni corrected α level=.01) indicated that the effect on fluid cognition was driven by lower scores in working memory (t(20)=-3.3, p = .003), executive functioning (t(20) = -3.8, p <.001), and processing speed (t(20) = -3.0, p = .008). The AE group also scored lower than the CON group on the inhibitory control and attention task, although this effect did not survive correction for multiple comparisons (p = .039). There were no significant group differences in episodic memory performance (p =.149). These findings support previous research indicating that youth with heavy prenatal alcohol exposure have impairments in fluid cognition as compared to controls. Furthermore, the NIH Toolbox Cognition Battery is sufficiently sensitive to detect these clinical effects. Research supported by National Institute on Alcohol Abuse and Alcoholism grant K99 AA022661.

366 11:45 am

**Effects of Late Gestational Cannabinoid Exposure on Behavioral Development in Rats**

Brandonn Zamudio, Psychology (U)
Jennifer Thomas, Psychology (D)

Given the recent legalization of marijuana for both recreational and medical use in several states, the rate of cannabis use has increased. Of particular concern is increasing use among pregnant women. The most psychoactive constituent in cannabis, delta-9-tetrahydrocannabinol (Δ9-THC), crosses the feto-placental barrier following maternal consumption and can directly affect the fetal brain. Previous retrospective clinical and animal studies indicate that developmental cannabinoid exposure can alter long-term behavior in emotional and cognitive functioning domains. However, given the increasing potency in cannabinoid products available today and the novel "synthetic marijuana" market, fetal consequences may be more severe than those observed in the past. Considering the need for research that parallels the increasing potency and legalization of cannabis, the goal of this study was to investigate the effects of cannabinoid exposure on behavioral development. Sprague-Dawley rats were randomly assigned to one of 3 doses of the cannabinoid receptor agonist CP 55,940 (CP; 0.10, 0.25, 0.40 mg/kg/day), or control vehicle. This agonist activates both CB1 and CB2 cannabinoid receptors. Subjects received intraperitoneal injections of CP or vehicle from postnatal day (PD) 4 through 9, a period of brain development equivalent to the human 3rd trimester. From PD 12–20, motor development was assessed, on PD 25, subjects were tested on an elevated plus-maze, which measures anxiety-related behaviors, and on PD 40–46, subjects were tested on a spatial learning task. Preliminary data indicate that activation of cannabinoid receptors alters the developmental trajectory of performance on a simple motor task. Emotional behaviors were not significantly altered, although CP increased grooming behavior; however, the highest dose of CP significantly impaired spatial memory among the female subjects. These data suggest that cannabis exposure late in gestation influences fetal development and, in particular, disrupts spatial memory in a sex-dependent manner. Elucidation of the effects of prenatal cannabinoid exposure may have important implications for public health that may guide future medical and public policy on cannabis.

367 12:00 pm

**The Effects of Providers on Metastatic Cancer Patient’s Decision to Enter Hospice in the United States**

Somia Said, Biometry (M)
Melody Schiaffino, Graduate School of Public Health

Problem Statement/Background: Hospice is a multidisciplinary approach to care for terminally ill patients who have less than 6 months to live. A number of metastatic lung, prostate, colorectal, or breast cancer patients choose to enroll in hospice care as it provides quality end of life service instead of the traditional clinical directed therapies that are more likely to ruin the little time they have left rather than prolonging it. Hospice patients expressed more satisfaction and less anxiety with the care they received than the conventional patients (Kane et. al., 1984). Furthermore, hospice provides emotional support and pain management. Cancer patients accounted for 37.7% of all
hospice admissions in 2011 (NHPCO, 2012). There has been a great focus on looking at factors associated with hospice entry but there has been limited literature looking at the decision-making process of enrolling for hospice care. For this reason, the focus of this research is to investigate the effects of a provider on a patient’s decision to enter hospice care. The secondary goal is to determine whether patient’s length of stay in hospice and survival differs by physician characteristics. Methods: To address our research question, we retrospectively used secondary data from Surveillance, Epidemiology, and End Results (SEER) cancer registry data and Medicare enrollment and claim files (administrative data) between 2000 and 2011. Non-hospice patients were used as a comparison group. The sample size for analysis is N=110,449 and will find descriptive statistics for our variables of interests using chi-square and t-tests where appropriate. Results/outcomes: The analysis for the present study is ongoing but we are going to fit a generalized linear mixed model (GLMM) with hospice as the binary outcome, a list of demographic and clinical covariates as the fixed effects, and provider as the random effects. This will allow us to explain the variability observed at the provider level. We are expecting to see the variability be explained by the providers and this will vary by cancer sites.

**Session J-7**

**Oral Presentation:**

**Antennas & Digital Signal Processing**

Saturday, March 5, 2016, 11:00 am

**Location:** Visionary Suite

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**368** 11:00 am

**Frequency Estimation Utilizing the Overlapping Autocorrelation**

Michael Martinez, Electrical Engineering (M)
Ashkan Ashrafi, Electrical Engineering

Frequency estimation of sinusoidal signals is a frequently addressed area of signal processing research since it is commonly used in applications such as radar, sonar, communications, and control theory. The signal is made up of a deterministic sinusoidal component and a noise component where the noise is assumed to be a zero mean Gaussian process with unknown variance. The goal is to estimate the frequency of the sinusoid given a finite number of samples from the signal. In this research a novel method of autocorrelation, called overlapping autocorrelation (OAC), is used to process the signal prior to applying the Modified Pisarenko Harmonic Decomposition (MPHD) frequency estimation algorithm. The OAC removes the majority of the noise corruption usually found in traditional autocorrelation methods while maintaining the sinusoidal nature of the signal. Current frequency estimation algorithms either meet the Cramer Rao Lower Bound (CRLB) on the variance of an unbiased estimator and have a high computational cost or do not meet the CRLB and have a low computational cost. The proposed method uses the OAC to reduce the noise level of the signal and therefore reduce the mean squared error (MSE) of the estimator with little added computational cost. The OAC generates a signal with a lower noise level, but the result is a correlated signal so the CRLB does not change. The main computer simulations consisted of calculating the MSE of the estimated frequency while independently changing the SNR, frequency, and number of samples of the signal. These simulations show that the proposed method has a smaller MSE than similar low computational cost algorithms at low and high SNRs with a significant improvement in low SNR scenarios. Other results show that for a wide range of frequencies and SNRs the optimization function which calculates the optimal autocorrelation lag for the MPHD method is not needed when the OAC is used to process the signal.

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**369** 11:15 am

**2 Elements MIMO Antenna for Tablet Application**

Anthony Wang, Electrical Engineering (M)
Satish Sharma, Electrical and Computer Engineering

A 2 elements MIMO PIFA antenna is designed mainly for tablet applications. The antenna is simulated on current modern tablet dimension size ground plane. This is also a frequency reconfigurable MIMO antenna which has four way switching to help shifting the frequency. The 2 elements MIMO antenna can cover most of the LTE, GSM, and EGSM cellular communication bands. The antenna for low band frequency is covered by using 4 switches (LTE B13, B14, B17, GSM850, EGSM900) while maintaining the same efficiency and gain. Also, the antenna for high band frequency is always covered even in different stage of low band switching (DCS, PCS, LTE B4, and LTE B7). Simulation results for this antenna including reflection coefficient magnitude, total efficiency, radiation pattern, isolation, capacity loss, and envelop correlation coefficient between each antenna elements has been obtained. The antenna will be designed and fabricated for experimental verification as final task of the 2 elements MIMO for tablet applications.
370 11:30 am
A Single Feed Planar Antenna With 4G Tunable Bands and Consistent Upper LTE Bands Between 1.51 GHz – 2.1 GHz
Rafid Damman, Electrical Engineering (M)
Satish Sharma, Electrical and Computer Engineering

A compact single feed dual band meandered planar antenna with 4G tunable bands and 1.51 GHz to 2.10 GHz consistent bands is proposed here. In this antenna design, a varactor diode is implemented on the meandered arm to tune the operational frequency of the lower band between the 690 MHz to 960 MHz frequencies. Whilst the 4G band tuning, the rectangular-shaped cutout portion of the antenna provides a consistent frequency bandwidth of 1.51 GHz – 2.15 GHz. Both the tunable and consistent frequencies show an acceptable matching based on $S_{11} \leq -6$ dB criteria and near Omni-directional radiation patterns. The antenna is able to cover several wireless (LTE) communication bands including 4G LTE bands.

371 11:45 am
Frequency Agile Dual Polarized Patch fed Dielectric Lens High Gain Antenna
Asmita Chaugule, Electrical Engineering (M)
Satish Sharma, Electrical and Computer Engineering

The proposed research deals with the design of a dual polarized microstrip patch antenna at 25 GHz. By suitably exciting the two feed ports of the patch antenna, horizontal linear and vertical linear polarizations may be achieved. The patch has been made frequency agile by introducing variable capacitances at all four corners to tune the operational frequency in the K-band while maintaining the radiation pattern symmetry with respect to both feeding ports. This gives the patch a frequency variable range from 20.8 GHz to 25 GHz (18.34 % tunability). To increase the gain, a dielectric lens is used to focus the beam from the tunable patch antenna in the forward direction. This effectively results in an 11 dB increase in the realized gain of the patch antenna. The co-polarization and cross-polarization separation for both polarizations are reported to be 15 dB in the forward direction.

372 12:00 pm
A Multifunctional Phased Array Antenna with Frequency Agility and Polarization Reconfigurability
Behrouz Babakhani, Electrical and Computer Engineering (D)
Satish Sharma, Electrical and Computer Engineering

A 1×4 linear phased array antenna of microstrip patches employing wideband frequency agility and simultaneous polarization reconfiguration has been studied here. The microstrip patch consists of a circular patch connected to an annular ring around it via 4 varactor diodes. This design achieves approximately 46% frequency agility between 1.5 GHz and 2.4 GHz. Four different radiation polarizations have been generated by adjusting ports amplitude and phase excitations with the help of a polarization feed network (PFN). A beam forming network (BFN) has been realized for beam generation based on the projection matrix method (pmM). The active element patterns (AEP) were used as the pmM inputs. Experimentally ±52º beam peak steering at 1.5GHz and ±28º beam peak steering at 2.4GHz has been verified based on 3dB gain variation criteria for both linear and circular polarizations.
Poster Presentations

Friday, March 4, 2016

Sessions A, B, C, D and G
ABSTRACTS

ABSTRACTS

Friday, March 4, 2016

Session A: Poster Presentations

Session A-9

Poster:

Flowing Fluids & Sparking Plasmas

Friday, March 4, 2016, 9:00 am – 10:30 am

Location: Montezuma Hall

373 Poster #1

San Diego State University Water Tunnel

Marlon Gerson, Aerospace Engineering (U)
Xiaofeng Liu, Aerospace Engineering and Engineering Mechanics

A pressurized water tunnel with a test section size of 5" (height) × 4" (width) × 24" (length) and a flow rate in excess of 660 gallons per minute is being designed and constructed at San Diego State University. This water tunnel will facilitate the establishment of advanced flow diagnostic capabilities, e.g., non-intrusive instantaneous 3-D spatial flow velocity and pressure measurement capabilities at SDSU, thus enabling the conduction of cutting-edge research projects on a variety of advanced topics such as turbulence, cavitation, unsteady aerodynamics, acoustics and fluid-structure interactions, to name a few. Using a system consisting of a compressor and a vacuum pump, this water tunnel can be either pressurized up to 5 atmosphere (73.5 psi) so as to be able to suppress the formation of cavitation occurring in flow field, or depressurized to vapor pressure level (near vacuum) so as to allow cavitation to appear in the test section. Major components of the water tunnel include a circle-square contraction, a double-honeycomb section, a primary contraction section, a test section, a diffuser pipe, a flexible 12" hose, a main pump equipped with a variable-frequency-drive, a 500-gallon settling tank, and accessory systems such as a pressure-head tank, a bubble removal tank, a filtering system, a vacuum pump and a compressor. The selection of large size impeller (12" diameter) of the pump, while reducing the possibility of cavitation occurring inside the pump, requires heavy-duty installation efforts made for connecting the 12" PVC pipes and elbows. In this presentation, details of the design and construction considerations, as well as the current construction and testing status of the tunnel project, will be presented to the SDSU community.

374 Poster #2

Nonlinear Aeroelastic Analysis of Flapping Micro Air Vehicles

Enrico Santarpia, Aerospace Engineering (D)
Luciano Demasi, Aerospace Engineering & Engineering Mechanics

Insects present excellent flight performance and are the ideal candidates for bio-inspired flapping unmanned aerial system (FUAS). An effective design of FUAS will try to reproduce the essential aspects of the insects biological features required for efficient flight with focus on the maximization of the payload and minimization of the power required to flap the wings. In previous studies it has been shown that to achieve a high efficiency of flight the wing must not be rigid. The unsteady aerodynamics of low Reynolds number flapping wings has not been fully understood (leading edge vortex). Although a complete comprehension of the phenomena is essential in order to have an efficient design of FUAS and so minimize the power requirement. The main goal of this effort is to understand the physics of low-Reynolds flight to mimic the exceptional abilities of biological flyers and do even better than them: artificial unmanned systems do not have biological constraints.

375 Poster #3

Instantaneous Pressure Reconstruction from Measured Pressure Gradient using Rotating Parallel Ray Method

Jose Moreto, Engineering Sciences (D)
Xiaofeng Liu, Aerospace Engineering and Engineering Mechanics

Pressure distribution plays a crucial role in determining flow phenomena and system performance for a variety of applications involving fluid flow. Because of the importance of pressure information in flow field, Liu and Katz (2003, 2006, 2008, and 2013) introduced and developed a novel non-intrusive technique which is capable of measuring the instantaneous spatial pressure distribution in a turbulent flow field. The technique relies on the so-called Circular Virtual Boundary, Omni-Directional Integration algorithm, which, by collecting the errors in the measured material acceleration over the entire measurement domain, minimizes the influence of the errors on the final pressure result and therefore obtains the correct pressure reconstruction. However, there is an inherent defect, i.e., the location dependence of integration weight associated with the algorithm. Other than the points near the geometric center of the domain, points at other places do not see a uniform weight of contribution from all directions.

To overcome this drawback, this study presents a novel pressure reconstruction method featuring rotating parallel ray omni-directional integration, which is an improvement over the
circular virtual boundary integration method for non-intrusive instantaneous pressure measurement in incompressible flow field. Unlike the old method, where the integration path is originated from a virtual circular boundary at a finite distance from the integration domain, the new method utilizes parallel rays, which can be viewed as being originated from a distance of infinity, as guidance for integration paths. By rotating the parallel rays, omni-directional paths with equal weights coming from all directions toward the point of interest at any location within the computation domain are generated, thus eliminating the inherent location dependence of the integration weight in the old algorithm. By implementing this new algorithm, the accuracy of the reconstructed pressure for a synthetic rotational flow in terms of r.m.s. error from theoretical values is reduced from 1.03% to 0.30%. Improvement is further demonstrated using direct-numerical-simulation generated isotropic turbulence data from the Johns Hopkins University turbulence database (JHTDB).

**376 Poster #4**

*Densification Mechanism and Mechanical Properties of Tungsten Powder Consolidated by Spark Plasma Sintering*

Geuntak Lee, Mechanical Engineering (D)
Eugene Olevsky, Mechanical Engineering

The densification mechanism of tungsten consolidated by spark plasma sintering is revealed by applying the constitutive equation of the continuum theory of sintering at the temperature range from 1600°C to 1800°C and pressure of 60 MPa. Also, the activation energy for sintering is assessed by densification curve of two different sintering temperature. Obtained rate limiting step is supported by electron backscatter diffraction analysis. The density of the compacted pellets reached 81~95% relative density depending on the sintering temperature and holding time. The crystal structure, chemical composition, porosity, grain size and micro-hardness are evaluated by X-ray diffraction, scanning electron microscopy, and energy-dispersive X-ray spectroscopy and Vickers micro-hardness machine. Carbon uptake during the spark plasma sintering results in the formation of tungsten carbide at the shell of the tungsten compact. Boron nitride is applied to remove the carbon diffusion from the die. The tungsten carbide thickness grows in time and diffusion coefficient of carbon in the tungsten was obtained.

**377 Poster #5**

*Densification, Microstructure and Grain Growth in Spark Plasma Sintering of Zirconium Carbide Powder*

Xialu Wei, Mechanical Engineering (D)
Eugene Olevsky, Mechanical Engineering

In the present work, a rapid sintering technique—spark plasma sintering (SPS) has been employed to consolidate micron sized zirconium carbide powder under various processing conditions to construct a SPS densification map for such material. Densification mechanisms incorporated in both low heating rate and high heating rate SPS of ZrC powder have been compared to those involved in hot pressing using power-law creep equation. The prepared specimens have been characterized to qualitatively describe the impact of processing conditions on the densification kinetics at the microscopic level. A quantitative study on the grain growth mechanism during the final SPS stage is conducted by taking porosity dependence into account.

**378 Poster #6**

*Optimization of Material Structure during Spark Plasma Sintering*

Diletta Giuntini, Mechanical Engineering (D)
Eugene Olevsky, Mechanical Engineering

Spark Plasma Sintering (SPS) is an innovative powder technology for the production of materials with outstanding properties for a variety of applications, from aerospace to biomedical components, and from defense to energy sectors. Powder media are densified by means of the flow of electric current through the surrounding tooling or the specimen itself, leading to strong Joule heating effects, and thus mass transfer through diffusion and viscous flow mechanisms, activated by the high temperatures reached. SPS is characterized by very high heating rates, which allow short processing times and therefore the retaining of small grain sizes, an important condition for the final dense materials to have high mechanical strength. This process rapidity renders SPS particularly suitable for the production of nano-grained materials, starting from powders with submicron particle sizes. Nano-sized powders, nevertheless, are prone to undesired agglomeration phenomena, which consist of the formation of particles clusters due to weak interactions such as Van der Waals forces. These agglomerates create hierarchical porous structures, constituted by small-size pores inside the clusters (intra-agglomerate porosity) and large-size pores among them (inter-agglomerate porosity). During sintering, the small pores undergo preferential densification, and the large pores become extremely hard to eliminate, causing microstructural inhomogeneities and leaving residual voids that greatly hamper the material characteristics.
The conventional strategies to address agglomeration issues consist of pre-SPS treatments aimed at breaking the clusters, but the subsequent handling of the powder prior to the densification process itself often render these procedures vain. We therefore propose to operate in situ de-agglomeration. An analytical model for the densification of hierarchical porous structures is developed, in which the nonlinear viscous rheology characterizing the consolidation of crystalline materials is embedded. The nonlinearity parameter, strain rate sensitivity, is dependent on the applied temperature, and it is on this fact that our porous material structure optimization is based. The continuum theory of sintering is employed to derive the shrinkage kinetics of the agglomerated powder sample, as functions of porosities and strain rate sensitivity. Thus, an appropriate choice of the SPS thermal regime leads to a more homogeneous densification.

Session A-9
Poster: Protein & Cell Engineering
Friday, March 4, 2016, 9:00 am – 10:30 am
Location: Montezuma Hall

379 Poster #7
Investigating Proteolytic Activity of Viral Proteases as Target for Antivirals in a Cell-based Context
Veronica Bichara, Cell and Molecular Biology (M)
Roland Wolkowicz, Biology

The mosquito-borne Chikungunya (CHIKV), Dengue (DENV), and West Nile (WNV) viruses are responsible for Chikungunya fever, Dengue hemorrhagic fever and meningitis/encephalitis, respectively. Major outbreaks of mosquito-borne diseases are becoming an emerging threat on a global scale. Currently there are no approved drugs or vaccines available to counter these viruses, which emphasize the need of novel tools for drug discovery initiatives. Many viruses depend on proteolytic processing carried out by viral and/or host proteases (PRs) at various stages in their replication cycle. In order to monitor the catalytic activity of viral PRs, our group has previously developed a cell-based assay utilizing the HIV-1 PR, and tested the robustness of the assay with FDA-approved HIV-1 PR inhibitors. The assay relies on three components: a Ga4/PR fusion, a reverse tetracycline transactivator (rtTA) system for Off/On inducible activation in the presence of doxycycline (Dox), and a reporter gene such as the green fluorescent protein (GFP), under the Ga4 promoter. In this system, active PR can cleave and disrupt the Ga4 fusion, which results in loss of GFP expression. On the contrary, when PR is inhibited or mutated, the Ga4 fusion remains intact, leading to GFP expression.

The primary objective of this project is to produce stable cell lines utilizing retroviral technology to develop a cell-based platform for large-scale screening suitable for flow cytometry and microscopy. In order to accomplish our main objective, three essential steps need to be achieved: a) Adapt the previous assay to monitor the activity of CHIKV, DENV, and WNV PRs, b) Assess whether our engineered wild-type and mutant constructs will behave in a catalytic active or inactive manner together with the other elements of the assay, c) Certify that the assays are as robust and reproducible for drug discovery. Despite significant efforts in discovering novel inhibitors targeting neglected tropical diseases, the absence of clinically approved drug molecules is a challenge in countering sudden disease outbreaks. We expect to develop a platform that can facilitate the characterization of factors, viral or host, that affect viral PR activity, enhancing our knowledge about the life cycle of these human pathogens.

380 Poster #8
An in vitro Investigation on Proliferation, Survival, and Differential Potential of CardioClusters
Kevin White, Biology (U)
Megan Monsanto, Sciences

The CardioCluster is a thoughtfully designed application of cardiac specific stem cells: endothelial progenitor cells (EPCs), cardiac progenitor cells (CPCs), and mesenchymal stem cells (MSCs). The method involves the creation of a microenvironment through the aggregation of the aforementioned cardiac specific stem cells. The MSCs will serve as a support stem cell and increase the differentiation of CPCs and EPCs into cardiac and endothelial lineages respectively. The primary goal of the CardioCluster is to facilitate repair in ischemic hearts by improving cell communication and enhancing regeneration of tissue damaged by inflammation and hypoxia associated with myocardial infarction. CardioClusters have been characterized for proliferation, survival, and lineage commitment. My focus will be on understanding the effect freeze-thawing has on maintaining CardioCluster integrity with regards to proliferative and survival potential, providing a basis for clinical use and potential long-term viability. To ensure long term preservation helpful for clinical application, freeze-thawing CardioClusters in liquid nitrogen and determining retention of three-dimensional shape, differentiation, proliferative and survival potential are necessary. Comparison of these characteristics pre/post-freeze-thaw will establish a realistic timeline for future clinical storage and use.
381 Poster #9

**Increased Extracellular Matrix Stiffness Decreases Proliferation of MCF-7 Cancer Cells in 3D Culture**

Carlos Brambila, Biology/Bioengineering (U)
Paul Paolini, Biology

Ductal carcinoma is the most common type of breast cancer. A progressive stiffening of tissue has been implicated during ductal carcinoma progression. Recent work has indicated that enhanced extracellular matrix (ECM) stiffness is not just a byproduct of malignancy, but that it induces malignant phenotypes, such as invasion and increased rate of proliferation of normal mammary epithelial cells. However, the impact of increased stiffness on cancerous mammary epithelial cells, relevant to more advanced stages of ductal carcinoma, remains unknown. Using a novel approach, we tested the effect of increased ECM stiffness on the proliferation of MCF-7 breast cancer cells, which are often used as a model cell line for estrogen receptor positive ductal carcinoma. Interpenetrating networks (IPNs) of alginate and reconstituted basement membrane matrix, which allow for independent control over mechanical stiffness, were used for 3D culture of MCF-7 cells. We encapsulated MCF-7 cells into IPNs with a mechanical stiffness of 50 Pa and 2 kPa, resembling the stiffness of normal and cancerous breast tissue, respectively, and quantified proliferation rate at the different stiffness values. A proliferation assay was implemented using ethynyl deoxyuridine (EdU) that labels proliferating cells in culture in order to obtain proliferation rates. Cell cluster morphology was also analyzed using image processing software and our results show that cells exhibited different morphologies in the soft and stiff IPNs, in regards to their circularity. Our results also revealed a slight decrease in proliferation rate in stiff IPNs relative to soft IPNs. These results suggest that the impact of matrix stiffness on proliferation may depend on the degree of malignancy of the mammary epithelium.

382 Poster #10

**Insights into the Assembly of the Threonylcarbamoyl Adenosine (16A) Biosynthesis System**

Sunjeet Baadkar, Biochemistry (M)
Manal Swairjo, Chemistry

The anticodon stem and loop domain (ASL) of a tRNA is the region that drives protein synthesis by binding to the cognate codons on mRNA during ribosomal translation. Modifications of this region are necessary in one third of all bacterial tRNAs for recognition and translocation, they enhance aminocoylation properties of tRNA, and prevent ribosomal frameshifting. $\text{T}^6\text{A}_{37}$ is a complex, universal modification found at position 37 of tRNAs decoding ANN codons ($\text{N}$ is any nucleotide) in all lifeforms. Four essential proteins, TsaB, TsaC, TsaD, and TsaE, are responsible for $\text{T}^6\text{A}_{37}$ biosynthesis in bacteria. The essentiality of the $\text{T}^6\text{A}_{37}$ system has been studied in recent years, the underlying molecular mechanisms involving tRNA recognition and specificity of the biosynthesis proteins remain unknown. To investigate the molecular mechanism of tRNA recognition by $\text{T}^6\text{A}$ biosynthesis proteins at structural and biochemical level, all four protein subunits (TsaB, C, D, E) were cloned, overexpressed and purified by metal affinity chromatography either as a his-tag or non-his-tag form. Analytical gel filtration experiments confirmed that TsaB and TsaD are homodimers, whereas TsaC eluted exclusively as a monomer. Further, ATP-dependent homodimerization of TsaE was observed. Using native gel shift and size exclusion chromatography experiments, we confirmed that heterodimerization of TsaB and TsaD, and established that TsaB, TsaD, and TsaE form a compact ternary complex only in the presence of ATP. Moreover, intrinsic Trp fluorescence quenching studies demonstrated that TsaB-TsaD heterodimer binds tRNA more tightly compared to individual subunits.

383 Poster #11

**Expression, purification, and validation of ANN-predicted phage structural proteins**

Shr-Hau Hung, Biology (D)
Anca Segall, Biology

Phages are the most abundant and diverse biological entities on earth, and they play critical roles in different microbial communities. Currently, the database of the phage diversity is increasing extensively because of the application of metagenomic sequencing in different ecosystems. However, sequences from environmental phage genomes are extremely diverse in that over 70% of them can’t be annotated by the database in GenBank. In 2012, Victor Seguritan et al. have developed a method using Artificial Neural Networks (ANNs) to predict phage structural proteins from metagenomic sequencing data. In this study, we would like to validate different ANNs specified to classify phage portal, capsid or tail proteins by co-expressing ANNs-predicted phage portal proteins with either capsid proteins or tail proteins and look for self-assembled phage-like structures under transmission electron microscopy (TEM). Since phage assembly is a highly ordered and complicated process that involves many proteins, expressing more than one structural protein at the same time may increase the opportunity to self-assemble into correct structures than expressing only a single protein. Currently, nine ORFs classified as capsid, portal, or tail proteins and two operons containing at least one portal protein and one capsid or tail protein were synthesized and cloned into IPTG-inducible vectors for protein expression. Among them, strains 1–9 containing individual ORFs showed successful target protein expression upon 4hr-IPTG induction at 30°C on SDS-PAGEs. However, strains...
10 and 11 (operons containing 3 and 4 ORFs) showed expression of only one protein from the first ORF. The soluble proteins expressed from strains 2 and 7 were subsequently purified, while expressed proteins from strains 1, 3, 4, 5, 6, 8, and 9 remained insoluble in cell debris. The solubility was then improved by co-expressing them with chaperons including DnaK, DnaJ, and GrpE upon over-night induction at 25°C. Next, purified protein samples from individual ORFs were negatively stained and visualized under TEM as procapsid, capsid, and tail-like structures. Ultimately, we would like to harvest phage-like structural protein complexes. Alternatively, combining individually purified structural proteins in appropriate buffer conditions and co-expressing with GroES-GroEL chaperonin complex will also be tested for self-assembly into phage-like structures.

**384 Poster #12**  
*Beta-Hairpins: Molecular Accessories for Helical Peptide Expression*  
Melissa Lokensgard, Chemistry (D)  
John Love, Chemistry

We present a biophysical study of a suite of helical proteins that have been modified to contain 12- and 17- amino acid additions on their termini that impart increased resistance to degradation in *E. coli* recombinant expression systems. The B domain of *Staphylococcus* Protein A (A₈) and the homeobox DNA-binding domain from *D. melanogaster* Engrailed (En) are small 3-helix bundles. These domains do not appreciably accumulate in the *E. coli* BL21 (DE3) cytoplasm when expression in a pET vector is chemically induced. This is likely due to host protein degradation/recycling factors that function to efficiently degrade these two proteins. Addition of sequences encoding either of two amino-terminal beta-hairpins to either the N- or C-terminus of *Staphylococcus* and En results in the accumulation of large amounts of these new chimeric proteins. Additionally, destabilization of the A₈ or En sequence does not abolish the expression enhancement effect of the beta-hairpin addition.

We have investigated the biophysical origins and effects of the beta-hairpin additions using circular dichroism (CD) spectroscopy, and have determined that the added sequence does not significantly perturb the secondary structure of A₈ or En, nor does it significantly influence the unfolding temperature (Tₘ). While investigation into the origin of the accumulation effect is ongoing, we hypothesize that the addition of the sequence is disruptive to recognition events in the native protein degradation machinery in *E. coli*. Thus, this approach represents both a biotechnological tool for expressing helical peptides recalcitrant to expression, as well as a system well-suited to probing mechanisms of protein recycling and homeostasis.

**385 Poster #13**  
*Identification of biomarkers for clinical trials in Friedreich's ataxia*  
Lina Petrosyan, Biology (U)  
Natalie Gude, Biology

The genetic defect in Friedreich’s ataxia (FRDA) is the hyperexpansion of a GAA·TCC triplet in the first intron of the *FXN* gene, encoding the essential mitochondrial protein frataxin. Histone posttranslational modifications near the expanded repeats are consistent with heterochromatin formation and consequent *FXN* gene silencing. Using a human neuronal cell model, derived from patient induced pluripotent stem (iPS) cells, we identified the HDAC inhibitor 109 that increases *FXN* mRNA levels and frataxin protein. A phase I clinical trial with 109 in FRDA patients showed increase of *FXN* mRNA in blood from patients treated with the drug and demonstrated that HDAC inhibitors hold promise as FRDA therapeutics. Derivatives of this molecule with improved brain penetration and acid stability are being developed in collaboration with Biomarin Pharmaceutical and have proven most effective in restoring *FXN* transcription. To aid subsequent Phase II/III efficacy trials in FRDA patients, we set to identify surrogate biomarker genes that respond to *FXN* levels in the cell. While frataxin provides a valid biomarker, increases in frataxin do not necessarily indicate reversal of mitochondrial dysfunction. To identify gene expression signatures that are common to cells that are affected in FRDA and circulating lymphocytes, we derived a set of isogenic iPS cell lines that differ only in the length of the GAA-TCC repeats, using helper-dependent adenovirus mediated homologous recombination. Gene expression analysis of isogenic neuronal cells revealed several pathways affected by the level of *FXN* transcription, namely mitochondrial respiration, cholesterol biosynthesis, neuronal differentiation, transcriptional regulation, and cell junction biology. RNA-seq analysis of PBMCs isolated from blood of FRDA patients and healthy individuals pointed at lipid metabolism and cell adhesion as pathways similarly affected in iPSC-derived neurons and peripheral blood cells. Validation of several of these genes in both cell types and in neurons and cardiomyocytes is currently underway and could shed light on the pathophysiology of FRDA, and provide biomarkers for future clinical studies.
**ABSTRACTS**

**Student Level:** (U)=Undergraduate; (M)=Masters; (D)=Doctoral

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**386 Poster #14**

*Functional significance of TCP chaperonin complex in maintaining cardiac and skeletal muscle function.*  
Luis Pablos, Biology (U)  
Girish Melkani, Biology

Heart failure is a leading cause of death in the United States and is associated with cardiac dysfunction and aging. We recently discovered three potential pathways by which time-restricted feeding (TRF) acts as possible behavioral therapy to attenuate age-associated cardiac dysfunction (Gill et al. *Science*, 2015). First, TRF restores the normal rhythmic outputs of the circadian clock. Secondly, we have shown that reduction genes associated with the mitochondrial electron transport chain (ETC) function can mimic TRF. Finally, mutation of CCT chaperonin function eliminates the beneficial cardiac effects conferred by TRF. These TCP chaperones were upregulated only in the heart during TRF, suggesting they might be important in protecting essential proteins from age-associated misfolding. The TCP/TRiC/CCT1 chaperonin is a macromolecular enzyme comprised of 8 subunits and is highly conserved with humans. Subunits of the TCP chaperonin complex display abundant and remarkably coordinated changes in mammals and flies. *In vitro*, the TCP complex is required for the folding of cytoskeletal proteins such as actin, tubulin and myosin. Human cardiac disease-related mutations in actin interfere with the ability of the TCP chaperonin to physically interact with actin. The goals of the proposed study are to find cardiac and muscle specific roles in protecting contractile proteins. Using the Gal4/UAS expression system, we have shown that cardiac-specific silencing of TCP chaperones leads to severe physiological cardiac dysfunction such as a significant reduction in cardiac contractility and performance as well as the enhancement of cardiac dysrhythmia. Cardiac-specific silencing of these chaperones also leads to severe myofibrils disarray resulting in significant reduction in life-span. Muscle-specific silencing of these TCP leads to severe functional and structural defects suggesting that these chaperones are required for striated muscle function. Silencing of cardiac and muscle-specific TCP chaperonins lead to progressive defects. The long-term goals of the proposed study are to find a functional link of TCP with the circadian clock and mitochondrial ETC, and to discover whether these pathways are synergetic or independent.

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**387 Poster #15**

*Modeling the Structural Origins of Drug Resistance to Isoniazid via key Mutations in Mycobacterium tuberculosis Catylase-Peroxidase, KatG*  
Matt Marney, Chemistry (U)  
David Hecht, Biochemistry

According to the World Health Organization, roughly 1/3 of the world’s population is infected by *Mycobacterium tuberculosis* (*Mtb*), the causative agent of tuberculosis (TB). Globally, 9.6 million new cases and 1.5 million deaths from TB were reported in 2014. Greater than 3.3% of new cases and 20% of existing cases of TB were reported to be caused by multi drug-resistant (MDR) strains. MDR-TB is defined to be cases that are resistant to the two most potent first line anti-tubercular drugs isoniazid (INH) and rifampicin. Resistance to INH results primarily from key mutations of the catalase-peroxidase, KatG, in particular at position 315 in the protein sequence (S315T). A notable percentage of INH resistant isolates escape detection by molecular diagnostic platforms that are designed based on these canonical mutations. Recently Valafar et al identified 14 novel amino acid substitutions in *Mycobacterium smegmatis*—a close relative that shares over 2,000 homologs with *Mtb*. In this study we present the results of in silico modeling experiments that demonstrate the causative role of these mutations in *Mtb*. Here we present a structure-based analysis of these amino acid substitutions using x-ray crystal structures (where available) and homology models. With several exceptions, these mutations cluster around three openings in the KatG tertiary structure leading to the heme group at the enzyme’s catalytic center. We studied the effect of these mutations on the tertiary structure of KatG focusing on conformational changes in the three channels to the catalytic site. These observations provide valuable insights into the structure-based origins of INH resistance and provide testable hypotheses for future experimental studies.
**ABSTRACTS**

**Poster #16**

**Dopaminergic Differentiation of Human Induced Pluripotent Stem Cells Derived from Parkinson’s Disease Patients for Autologous Cell Therapy**

Jacob Ruby, Biology (U)
Natalie Gude, Biology

Parkinson’s disease (PD) is a progressive disorder caused by the death of dopaminergic (DA) neurons in the substantia nigra. In the 1990s, fetal nigral grafts transplanted into the striatum of PD patients proved efficacious in some cases, but sample variability and lack of quality of control limited efficacy. Recently, cell replacement therapy for PD has gained momentum with the development of robust differentiation protocols that produce A9 type DA neurons. Furthermore, the advent of induced pluripotent stem cell (iPSC) technology allows for autologous cell sources. The Loring lab is working toward neural transplantation of DA neurons derived from patient-specific iPSCs with stringent quality control. This work is focused on (1) identifying non-neuronal cell types in differentiated cell populations and (2) investigating the immunogenicity of the cells. Fibroblasts from 10 patients recruited with IRB approval at the Scripps Clinic were reprogrammed with non-integrating Sendai virus carrying the 4 Yamanaka factors. Differentiation using a modified floor-plate protocol produces midbrain DA neurons expressing FOXA2 and tyrosine hydroxylase (TH). Analysis of mRNA microarray data with the bioinformatics tool, DAVID, revealed 5204 genes significantly upregulated during neural differentiation. Neuronal genes (2081) were upregulated, including FOXA2, LMX1A, OTX2, and TH. A subset of 437 genes was upregulated and corresponded to non-neural tissues including muscle, lung and testes. Validating gene expression with quantitative PCR will reveal novel gene targets that can help refine our differentiation protocol and provide targets for negative selection. To assay for immunogenicity of iPSC-derived DA neurons we used a mixed lymphocyte reaction with autologous or allogenic DA neurons mismatched for MHC class I proteins. Initial results show a 7-fold increase in CD4^+ T-cells in an allogenic (15%) setting vs matched DA neurons and peripheral blood mononuclear cells (2%). This suggests autologous iPSC-derived neurons will elicit a lower immune response than allogenic cells. Targeting a reduction of non-dopaminergic gene expression to allow for the enrichment of DA neurons and confirming the histocompatibility of iPSC-derived cells may yield a safer and more efficacious cell replacement therapy.

**Poster #17**

**Correlation of IL12p35 and IL4 levels in colonic tumors in a mouse model of colorectal cancer**

Savannah Sawaged, Biology (U)
Kathleen McGuire, Biology

**BACKGROUND:** Colorectal cancer arises from abnormal cell growth in the large intestine that matures into malignant tumors. These tumors are characterized by inflammation which is driven mainly by cytokines. Cytokines are involved in signal transduction and help regulate inflammatory responses. In larger tumors cytokine levels change, with some increasing and others decreasing, indicating a correlation between tumor size and cytokine concentration. We examine specific correlations between cytokines Interleukin 12A (IL-12 p35), Interleukin 4 (IL-4) and colorectal tumor development to help us further understand how cancer suppresses the immune system. We are using a mouse model of colon cancer in these studies that closely mimics human disease. IL-12 is composed of two subunits: IL-12A p35 and IL-12B p40. IL-12A is involved in differentiating T cells into T\(_{\text{H}}^1\) cells that promote cytotoxic T lymphocyte (CTL) anti-tumor immunity. IL-4 is responsible for T\(_{\text{H}}^2\) cell differentiation and has been shown to reduce T\(_{\text{H}}^1\) CTLs, macrophage, IFN-gamma, and IL-12 immunity in tumors. METHODS: Tumors analyzed in this study were isolated from mouse colons. Tumors <4mm, tumors >4mm, and tumor adjacent tissue (TA) were harvested from the mice. RNA isolated from each tissue [Zymo Research Kit] was used to synthesize cDNA [Quanta Bio cDNA Supermix]. Primers were designed with the following characteristics: an optimal melting temperature of 60° Celsius, a GC base pair content of 50-55%, an amplicon size of 100-150 base pairs, and a primer size of 18-20 base pairs for PCR and qPCR to monitor the levels of IL-12p35 and IL-4. One primer pair was identified and ordered for each cytokine using the Harvard Primer Bank. RESULTS & CONCLUSIONS: Each primer pair will undergo efficiency studies to determine optimal gene expression quantification (90% to 110% efficiency) and then the levels of each of the two cytokines will be measured in the tumors and the isolated TA tissue. Gene expression analyses will be performed using qPCR [Biorad, Sybrgreen] with β-actin as the housekeeping gene to normalize gene expression. Upon qPCR analyses, we expect to see a decrease in IL-12 p35 and increase in IL-4 levels as tumor size increases.
Role of Autophagy Protein ATG16L1 in Group B Streptococcal Entry into Brain Endothelial Cells
Mirae Dong, Microbiology (U)
Kelly Doran, Biology

Group B Streptococcus (GBS) is a Gram-positive bacterial pathogen that has been associated with the development of neonatal disease, namely meningitis. GBS has the ability to persist in the bloodstream and ultimately cross the blood-brain barrier (BBB). Previous research has proven that GBS can directly enter human brain microvascular endothelial cells (hBMEC), and these cells respond to pathogen infection with a robust autophagic response through increased amounts of active LC3 and p62 degradation, two hallmark indicators of autophagy. Therefore, we sought to investigate the role of a key autophagy related protein, ATG16L1. ATG16L1 plays an important role in autophagosome biogenesis through its ability to bind ATG5 and ATG12 thereby creating the ATG5-12-16L1 complex which lipidates LC3 to phosphatidylethanolamine for autophagosome elongation. To determine if ATG16L1 is necessary for GBS entry, we employed CRISPR (clustered regularly interspaced short palindromic repeat) mediated genomic editing to disrupt ATG16L1 in brain endothelial cells. Our results show that while GBS readily attached to ATG16L1 deficient cells, bacterial entry was significantly reduced compared to that observed in WT hBMEC. It has been reported that ATG16L1 interacts with clathrin-coated vesicles and that various microbes utilize clathrin-mediated endocytosis for entry into host cells. Therefore, we assessed the level of GBS invasion in hBMEC in the presence of specific inhibitors to this pathway. Our results demonstrate that inhibition of clathrin-mediated endocytosis, through disruption of the essential protein dynamin and the uncoating of clathrin coated vesicles, resulted in decreased bacterial invasion. Together, our results suggest that clathrin and ATG16L1 mediated entry is important for GBS invasion into the brain endothelium. Future studies aim to further characterize the role of ATG16L1 during GBS intracellular trafficking, as well as how this protein interacts with inflammatory signaling cascades in the context of bacterial meningitis.
considering both linear and nonlinear autoregressive processes. The classical Box-Jenkins prediction interval is also evaluated. To carry out the comparisons of the empirical coverage levels and average lengths, we are performing Monte Carlo simulations. We explore the applicability of the bootstrap methods for prediction intervals using a time series from the Energy Information Administration—EIA. Preliminary results show that if the last observations of the bootstrap samples are not deliberately forced to assume the original sample values, the stationary bootstrap results in extremely low coverage.

393 Poster #21

A genome sequence search engine for papers

Heqiao Liu, Computer Science (M)
Robert Edwards, Computer Science

The amount of published papers about studies of gene and genome sequence increases rapidly comparing to years ago. It is an outcome of the improved efficiency of sequencing technologies, the increased scale of participants of the area of study, and the popularity of on-line paper publications. It brings the demand to identify the sequence(s) discussed in such papers, and, on the contrary, a search engine to find all papers in a set about a target sequence.

The challenge of such system is to provide results with certain level of accuracy. In most papers, sequence is represented by few types of identification serial number, that such character-number sequence can be applied to different subjects in irrelevant areas. Thus, a strategy needs to be built to improve the result correctness of the system. The current method for the system is to evaluate the possibility of a paper relating to bioinformatics or genetic study, and use the weight to rank to filter results.

394 Poster #22

Using Palomar Transient Factory Survey Data to Confirm Gravitationally Lensed Quasar Candidates

Isaac Spitzer, Astronomy (M)
Robert Quimby, Astronomy

Strong gravitational lensing is an effect whereby massive objects, such as galaxies, can bend light from more distant background sources resulting in multiple images of the same source. Strongly lensed quasars can be used to study the Hubble constant, which measures the expansion rate of the universe, and the lens mass by measuring time delay and image separation (e.g. Vuissoz et al. 2008). These objects can require years of data to confirm however, so using data from preexisting surveys could greatly reduce the amount of time required to study them. We attempt to use Palomar Transient Factory survey data to detect variability in strongly lensed quasars and to measure time delays, the difference in the amount of time required for light from each quasar image to reach us. We test our procedure using known gravitationally lensed quasars with measured time delays.

Preliminary results indicate that the coverage of known lensed quasars, as well as the spatial resolution of the Palomar Transient Factory survey telescope combined with the relatively small image separation, may not be sufficient to accurately measure the time delay. We investigate the applicability of our technique to other surveys to determine if they are more suitable for this research.

395 Poster #23

Moderate Ethanol Consumption Regulates Lipid Metabolism and Inflammatory Gene Expression in Rats

Meegan Justice, Nutritional Sciences (M)
Mee Young Hong, Exercise and Nutritional Sciences

Studies have shown a J or U-shaped correlation between consumption of alcohol and cardiovascular disease (CVD) risk and suggests that light to moderate drinking may provide some cardiovascular benefits. The present study examined the underlying mechanisms of how moderate alcohol consumption provides a protective effect against cardiovascular disease. Male Wistar rats (N=24) were divided into a control group and a treatment group (n=12/group). The treatment group was administered a 20% v/v ethanol solution on alternate days for 12 weeks. No difference was found in body weight gain between the two groups, however, epididymal fat weight was lower in ethanol-fed rats (P=0.030). The ethanol treatment group evidenced significantly lower blood glucose levels (P=0.030), total cholesterol levels (P=0.036) and LDL-cholesterol levels (P=0.031) upon comparison to the control group. There was a significant reduction observed in the expression of hydroxymethylglutaryl-coenzyme A reductase (Hmgcr) and sterol regulatory element-binding protein-2 (Sreb-2) in the ethanol group (P=0.026 and P=0.034, respectively), suggesting that ethanol lowers cholesterol levels via down-regulation of genes involved in cholesterol synthesis. Paraoxonase-1 (Pon-1), which is associated with inhibition of LDL-cholesterol oxidation, was up-regulated in the ethanol group (P=0.029). Cyclooxygenase-2 (Cox-2) and nuclear factor NF-kappa-B p65 subunit (Rela) gene expression was significantly decreased in ethanol-treated rats (P=0.016 and P=0.047, respectively), indicating possible anti-inflammatory effects. These data demonstrated that moderate ethanol consumption may reduce the risk of CVD by reducing body fat, improving blood cholesterol and blood glucose, and modulation of gene expression involved in inflammation. This study was funded by NIH AA023291 and supported by San Diego State University N302L Advanced Nutrition Laboratory.
Session A-13
Poster: Water, Toxins, & Health
Friday, March 4, 2016, 9:00 am – 10:30 am
Location: Montezuma Hall

396 Poster #24
Measuring the Success of Physical Barriers as Effective Tools for Aiding the Conservation of La Jolla’s Harbor Seal Colony
Rachel Guches, Sustainability (U)
Vinod Sasidharan, Hospitality and Tourism Management

The harbor seal colony which has resided in Casa Beach, La Jolla for decades has made the beach a major tourist destination in San Diego, California. This attraction has brought in a constant flow of people coming to view the seals up close, which has resulted in negatively affecting the seals breeding and resting behaviors (Seal Conservancy, 2016). To avoid human-seal interactions, the California Coastal Commission approved the City of San Diego’s application for temporary permits for seasonal beach closures and a viewing guideline rope. The City has put these physical barriers on the beach to prevent intrusive behavior towards seals from both residents and tourists. Past literature has show that conservation methods are ineffective when the public has a low level of understanding regarding an environmental issue and a lack of accessibility to information (McKinley and Fletcher, 2011). Resident support for a conservation method is influenced by their perceived ecological and economic value (Garla et al., 2015). This research investigated the influence of the physical barriers on the public’s knowledge and attitudes toward the seal colony. It is proposed that the presence of a barrier between animals and humans does not increase understanding of the effects of human disturbance on animals. It is also predicted that a local community’s support for animal conservation will not be increased due to the presence of a barrier. Additionally, tourists who come in contact with a physical barrier while viewing an animal will be more interested to learn about that animal’s conservation. Data was collected using a questionnaire which was completed either in person or through mail by residents of La Jolla and San Diego and tourists. Survey questions examined public knowledge and support for harbor seal conservation after the implementation of the physical barriers. Similar to past studies on public support for conservation efforts, findings from this study show that without some form of additional education, physical barriers may not be enough to influence positive conservation behaviors and knowledge towards an animal. The limitation of this study is that data collected was self-reported, which increases the potential for inaccurate responses.

397 Poster #25
Characterization of E. coli In Recreational Waters of the Riviera Nayarit, Mexico and Possible Implications for Human Health
Megan Malone, Public Health (U)
Katherine Comer-Santos, Sciences

Escherichia coli (E. coli) is a bacterium that is part of the normal flora of the gut and is commonly found in the lower intestine of mammals. Most E. coli are non-pathogenic, however, the possibility does exist for E. coli to cause the host to become sick and is a strong indicator of pathogens which can cause human illnesses such as respiratory and gastrointestinal disorders (EPA 2015). E. coli can survive outside of the host for extended periods of time, and as such, can become problematic in regions where fecal contamination is common.

The Mexican agency Secretariat of Environmental and Natural Resources (SEMARNAT) tests tourist beaches that could potentially have high levels of contamination since the region has historically had problems with untreated sewage entering recreational waters. The goal of this project was to supplement testing to help determine the levels of E. coli, the potential point sources of contaminations, and find an ambient indicator to alert people of high risk swimming events.

A seven-week research study in Sayulita, Nayarit, Mexico, was conducted in July and August 2015 at a popular tourist beach. Samples were collected from both the ocean and rivers to test for the presence of E. coli via the Colilert-18 Most Probable Number (MPN) protocol. Levels of fecal coliforms and E. coli were compared to the ambient environmental factors of water temperature, rainfall, tide direction, and sea level. Preliminary results show that various testing sites exceeded the SEMARNAT published recreational standard of <200 MPN for E. Coli during the sampling times, with two sites consistently exceeding the standard levels over the duration of the study.

Results suggest that further research would be beneficial to identify any correlations between coliform presence and environmental variables that could be used to alert local populations of potential high pathogen risk. Further research will also need to be conducted in order to identify the sources of contamination and the effect of the water quality on human life.
398 Poster #26
Persistance of Oil-Derived Hydrocarbons in a Coastal Environment
Cari Campbell, Environmental Engineering (U)
Natalie Mladenov, Civil, Construction, and Environmental Engineering
The Refugio oil spill in May 2015 released 142,800 gallons of crude oil along the coastline of Santa Barbara. Interaction of oil compounds with the environment and natural attenuation of those compounds continues to be a topic of interest. There has been much research done on the initial biodegradation of crude oil once released into the environment, but less is known about the longer-term effects of photodegradation.

In our experiments, two types of crude oil will be applied as a slick to seawater in clear glass incubation bottles. These bottles will be placed in triplicate inside of a solar simulator to simulate the effects of natural sunlight on oil transformation. We intend to observe the combined and independent effects of sunlight and microbial degradation on the crude oil. Therefore, one set of samples will be irradiated with sterile-filtered seawater (free of microbes), so the only factor having an effect on the samples will be solar radiation. Another set of samples in the solar simulator will still contain microbes to simulate the combined effects of sunlight and microbial degradation. A third set of samples will contain microbes but be kept in the dark to simulate only microbial degradation.

Each sample will undergo two types of analyses – a fluorescence spectroscopy reading and analysis with gas chromatography. Fluorescence readings will occur every other day and GCxGC/TOF-MS analysis will be performed at time zero and after 30 days. Obtaining the 3-D fluorescence is useful for detecting the spectral signature of organic compounds that degrade or form over the course of the experiment. We will track how the intensity of that signature changes over time and, as a result, determine the kinetics of degradation. The GCxGC analysis will further identify what compounds are present in the oil-contaminated seawater and which ones were removed from microbial and photochemical degradation.

399 Poster #27
A Role for Marine Macro Algae in Speciation of Iodine in the Coastal Ocean
Jennifer Gonzales, Geological Sciences (U)
Carl Carrano, Chemistry and Biochemistry
The speciation of the trace element iodine in the marine environment is not well understood. Based on thermodynamics, iodate should be the only species of iodine found in the water column and yet the concentrations of reduced forms of iodine (i.e. iodide) may range from <0.1-0.3 µM which is significant compared to total iodine’s constant distribution of around 0.45 µM. The concentration of iodide is highest in the photic zone and decreases with depth. It is also typically higher in coastal zones as compared with open ocean environments. These anomalies suggest that presence of iodide may be linked to biological productivity. In particular, marine macroalgae such as Macrocystis pyrifera which produce dense kelp forests are known to have highly evolved halogen metabolisms and high biological productivity rates, which we hypothesized could influence iodine speciation in the coastal regime. To test this hypothesis we collected water samples for an entire year along a transect through the Point Loma (32°43’N, 117°16’W) kelp beds and analyzed them for iodide, iodate and total iodine via cathodic stripping square-wave voltammetry (CSSWV). Water samples from a kelp free area (Scripps Pier in La Jolla) served as non-biological control. The results of this year-long study will be presented.

400 Poster #28
Bioaccumulation of Cigarette Butt Toxicants in the Freshwater Fish, Oncorhynchus mykiss, and Saltwater Mussel, Mytilus galloprovincialis
Lenard Yabes, Public Health/Environmental Health (M)
Eunha Hoh, Graduate School of Public Health
Cigarette filters and any leftover tobacco comprise the single most abundant form of litter worldwide. Colloquially termed “cigarette butts” (CBs), this single waste product generates millions of pounds of toxic pollution, as an estimated 8 million CBs are littered per minute. Despite California’s strides in smoking cessation, cigarette consumption and its concomitant litter output are rising globally. Inevitably, CBs travel downstream via surface erosion/rainfall into aquatic ecosystems. Their cellulose acetate filters are non-biodegradable, and 4000+ chemicals including arsenic and nicotine may contaminate the environment from CB pollution. Studies have revealed that CB chemicals form
a toxic leachate that has caused deleterious effects to aquatic life. However, human health exposures to these persistent and potentially bioaccumulative tobacco contaminants remain unknown. This innovative research looks to elucidate the bioaccumulative potential of CB leachate in the aquatic food chain, in an ongoing attempt to assess its latent presence in human food products and its impact on public health. Machine-smoked CBs were used throughout the testing phase for consistency. Range-finding tests were performed to determine the maximum tolerable CB leachate concentrations — [0.5 CB/L] of freshwater for the rainbow trout, and [1 CB/L] of saltwater for the mussel — whereby no mortality or behavioral changes occurred. Furthermore, a 28-day, definitive round of testing was employed, whereby each species was exposed to selected dilutions to further assess bioaccumulation. For chemical identification and elemental determination, non-targeted analysis implementing GC×GC/TOF-MS and ICP-MS were conducted respectively. Currently, rainbow trout and mussel tissues are undergoing extraction analysis and method development in order to determine potential leachate chemical retention. The findings of this research will be used in an ongoing effort to assess human exposures to the hazardous chemicals associated with cigarette butt toxic waste.

Session A-14

Poster: Catalysis 1
Friday, March 4, 2016, 9:00 am – 10:30 am
Location: Montezuma Hall

401 Poster #29
Crystalization of the Nitrile Reductase QueF in Complex with Substrate and Cofactor
Vanessa Quach, Chemistry/Biochemistry (U)
Manal Swairjo, Chemistry and Biochemistry

Nitrile reduction is currently carried out synthetically using hydrogenation over transition metals, a method that produces unwanted byproducts which harm the environment. The nitrile reductase QueF is an excellent candidate for the development of an environmentally friendly industrial biocatalyst as an alternative to the currently used metal catalysts. The enzyme QueF catalyzes the reduction of the nitrile group in 7-cyano-7-deazaguanine (preQ) to the corresponding amine in 7-aminomethyl-7-deazaguanine (preQ1) in the biosynthesis of queuosine, a structurally complex modified nucleoside of tRNA. This reaction constitutes the only example of biological nitrile reduction known to date. Developing a detailed understanding of the catalytic mechanism of QueF is essential to any effort to develop it as an industrial biocatalyst.

In this study, we aim to elucidate the QueF mechanism by determining the crystal structures of the enzyme bound to its substrate and cofactor simultaneously. To accomplish this, we pursued the crystallization of three inactive mutants of B. subtilis QueF (Glu78Asn, Glu78Ala and Cys55Ala) in complex with preQ0 and NADPH. The results show promise for obtaining large crystals suitable for crystallographic studies.

402 Poster #30
Characterization and Kinetic Parameters of Full Length Human DNA PolE and Carcinogenic Mutants
Lucas Luna, Chemistry (M)
Crystal Sohl, Chemistry/Biochemistry

Colorectal cancer is the third leading cause of cancer-related deaths in the United States. One of the hallmarks of some subtypes of these tumors is that they possess a mutant version of DNA Polymerase epsilon (PolE) confers a hypermutated phenotype, contributing to tumorigenesis. PolE is one of the three main DNA polymerases for genomic replication, likely responsible for DNA synthesis on the leading strand. However, little is known about its catalytic mechanism due to barriers in heterologous protein expression. To elucidate its mechanism, we have generated full length, exonuclease competent, wild type human PolE in HEK293T cells. We will carry out pre-steady state kinetic analysis of this enzyme using a rapid chemical quench to perform single nucleotide incorporation and excision assays. We will determine rates of correct and incorrect dNTP incorporation, and of excision of correct and incorrect nucleotides. Understanding the kinetic parameters of wild-type PolE creates a baseline to which we can compare the oncogenic mutant variants of PolE. The exonuclease domain mutation, P286R, is one of the most frequently observed mutation signatures in colorectal tumors. We hypothesize mutations to the exonuclease domain will alter fidelity by reducing proofreading activity, thus creating and propagating DNA replication errors. Comparing the kinetic parameters of mutant and wild type PolE may suggest novel methods of combating cancer growth and metastasis.

403 Poster #31
Bifunctional Catalysts for Selective Oxidation of Water and Organic Substrates
Robert Vasquez, Chemistry (U)
Douglas Grotjahn, Chemistry

Ruthenium (II) (terpyridine)(bipyridine) complexes have received significant attention in the field of homogenous water oxidation (WOX). Meyer and coworkers have shown that replacing one pyridine group of the bipyridine ligand with an N-heterocyclic carbene (NHC) improves catalytic activity. It is our hypothesis
that these complexes can be further improved upon by adding a pendent base to the remaining pyridine ring, which may mediate proton transfer in a water-nucleophilic attack (WNA) mechanism. In addition, a pendent base could possibly prevent the issue of catalyst deactivation by anation as proposed by Meyer’s group. For WOX, preliminary testing using cyclic voltammetry (CV) of the complex with a methoxy pendent base has shown promising catalytic current, an O\textsubscript{2} reduction wave, and a ruthenium (II)/(III) couple. Further CV testing will be applied to the remaining analogs once synthesized. In recent literature, there are several published examples of WOX catalysts used for selective alkane oxidation. Clues in the literature suggest that proton transfer can help with C-H functionalization. Finally, catalysts with proton-transferring ligands designed for water oxidation may be applied to alkane oxidation and allow easier synthesis of molecules that are important to biological systems and drug metabolism. To achieve alkane oxidation, catalysts will be tested with reagents like PhI=NTs or PhI=NNs or peroxides, and simple organic substrates. This presentation will discuss the synthesis, characterization, electrochemistry, and catalytic activity of these complexes towards oxidation of water and organic substrates.

404 Poster #32
A Study of the Photoinitiated Growth of Silver Nanoparticles Using the Poly(vinyl-alcohol) Group of Polymers as Capping Agents
Ian Marshall, Chemistry (U)
David Pullman, Chemistry
Citrate anions are known for their role as capping agents in the synthesis silver nanoparticles via reduction of silver nitrate. The Pullman lab has found a new method of synthesis involving the photoinitiated reduction of silver ions. The mechanism involved in the photo formation of silver nanoparticles using citrate has been found to utilize the carboxylic acid and alcohol group. Iron ions have also been found to increase the growth rate of the formation of silver nanoparticles linearly to the amount of iron present. In addition to citrate there are many other organic molecules and polymers with the same functional groups (alcohols, carboxylic acids) and these molecules’ ability to serve as capping agents of the photo growth of silver nanoparticles are not known. My project focuses on poly(vinyl-alcohol) based polymers and their ability to serve as capping agents in the photogrowth of silver nanoparticles. The role of iron added to the poly(vinyl-alcohol) capping agents is also being investigated.

405 Poster #33
Increasing ligand denticity: as a strategy for a better water oxidation catalyst (WOC)
Farzaneh Saeedifard, Chemistry (M)
Douglas Grotjahn, Chemistry and Biochemistry
Water splitting is a promising process need for production of green energy involving the oxidation of water to oxygen and reduction of proton to hydrogen. The efficiency of the water oxidation process is the main issue, which requires a stable and robust water oxidation catalyst. One suggested deactivation pathway of WOCs is loss of ligand(s). Therefore, increasing ligand denticity could be a useful strategy to develop stable and robust WOCs. Herein, we will discuss synthesis and catalytic activity of a new family of complexes (structure 1) with a new penta-dentate ligand that has shown promising results for water oxidation and also has allowed a variety of metals to be used.
of vaccine requirements on level of gun violence ($p = 0.05$, $\eta^2 = 0.976$). Incidents of gun violence were significantly more intense in states with three possible reasons to opt out of vaccination requirements. There was no significant correlation between the number of vaccines required and intensity of violence ($p = 0.05$) or between socioeconomic status and the level of violence ($p = 0.05$). The results suggest the need to further examine the potential for stricter healthcare requirements and utilization to serve as preventative measures to reduce school violence.

407 Poster #35

Mental Health Screening of Females in Juvenile Detention: Does Age Matter?

Tiffany Lapuebla, Social Work (U)
Melinda Hohman, Social Work

Female juvenile offenders with mental health problems are more at risk to “penetrate” the juvenile system for less serious offenses (Espinosa et al., 2013). While numerous studies have examined the mental health needs of juvenile offenders by gender, few have examined the needs of younger female offenders versus older female offenders. Identifying the needs and concerns at intake for this age group is pertinent as psycho-social problems (substance abuse, delinquency, depression, suicide attempts and eating disorders) often increase during the late teens (Lenssen et al., 2000). Understanding screening scores by age may help in meeting both trauma and developmental needs of female juvenile offenders. Questions: Do mental health needs of females involved with the delinquency system vary by age? Have female mental health needs changed over time? Method: This study analyzed data collected by the San Diego Probation Department from adolescent females (N=5,615) who were detained at the Kearny Mesa Juvenile Detention facility from 2009 to 2015. At intake, adolescents are given the MAYSI-2, a 52-item self-report screen for mental health problems. The MAYSI specifically screens for Alcohol/Drug Use, Anger-Irritability, Depression-Anxiety, Somatic Complaints, and Suicide Ideation. It provides a clinical cutoff of “Caution”, meaning further assessment may be warranted. Anger-Irritability is defined as “individuals experiencing frustration, prolonged anger, and moodiness and risk of angry reaction, fighting and aggressive behavior” (Bailey, 2007, p. 40). Using chi square analysis, this study compared female clients grouped by age (12–14 and 15–17), year, and caution status (yes/no). Results: Overall, older females were significantly more likely to fall into the “caution” category on Somatic Complaints and Alcohol/Drug Use while younger females were significantly more likely to fall into the “caution” category on Anger-Irritability. There were no differences found in older females versus younger females in the areas of Suicidal Ideation and Depression and Anxiety. Rates did vary by year. Conclusion: Increasing clinical attention as well as research regarding the factors behind Anger and Irritability in younger females may help with immediate concerns regarding aggressiveness while in detention. Trauma-informed care may help address this need as other problems are likely to develop as female adolescents age.

408 Poster #36

Role of Children’s Hostile Attributions of Key Relationship Figures in Predicting Behavior

Shaan McGhie, Psychology (U)
Joseph Price, Psychology

There is research to indicate that children’s social information processing are an important in determining how children react to the world around them. Crick and Dodge’s (1994) theory of social information processing considers how the attributions that children make to the actions of others can affect their own behavior. Attributions of hostile intent in response to neutral stimuli are well known to be linked to aggression in children (Cillessen, Lansu, Van Den Berg, 2014). Though this link has been wellstudied, it has largely only been studied in regards to children’s attributions of an unfamiliar peer. The current study examines children’s attributions towards five different relationships figures: mother, father, teacher, unfamiliar peer, and best friend, and how these attributions relate to children’s behavioral problems. It was hypothesized that children who display hostile attribution biases will be more likely to exhibit externalizing behavior problems. The data for this study is a subsample consisting of 100 children from a longitudinal study of maltreated and nonmaltreated children entering elementary school. To measure hostile attributions, children were told stories where one of the relationship figures mentioned above was involved in a negative social situation with the child, and their intention was ambiguous. Children were asked whether the other person in the story was “not being mean”, “hard to tell”, or “being mean”. Measures of children’s behavior problems were derived from scales of the parent version of the CBCL. Correlational analyses revealed that children’s attributions toward mother, father, teacher, peer and best friend were all significantly related to each other. Overall externalizing behavior problems and the subscale for aggressive behavior were both significantly related to hostile attributions of all relationship figures, except the unfamiliar peer. The subscale for delinquent behavior was related to the hostile attributions of all five relationship figures. These results expand previous research indicating that children’s hostile attributions toward an unfamiliar peer are related to aggression and externalizing problems. The results of this study indicate that children’s attributions of a variety of relationship figures, including parents, teachers, and best friends are also related to aggression, externalizing problems, and delinquent behavior.
409  Poster #37
Violence Exposure and Depressive Symptoms Among High-Risk Children.
Cassandra Cala, Psychology (M)
Joe Price, Psychology

According to the National Survey of Children’s Exposure to violence, over 60% of children ages 17 years and younger were exposed to some form of violence in the past year. Exposure to violence increases the likelihood of internalizing and externalizing problems in children. Although there is currently no one definition of exposure violence, in a recent meta-analysis, a limited definition of exposure to violence was offered: when a child sees, hears, is directly involved in (intervened) or experiences the aftermath of physical or sexual assaults that occurs between caregivers. In this study we examined children’s exposure to violence and children’s experience of physical abuse in predicting teacher and parent ratings on the anxious/depressed subscale of the Child Behavior Check List (CBCL). The sample came from a 3-year longitudinal investigation and included kindergarten and first grade children (51% male) some of whom had not experienced maltreatment (n= 100) and some who had experienced neglect alone or neglect and physical abuse (n=83). Only those children who had experienced physical abuse and/or who were exposed to violence were included in the analyses. Measures of the severity of physical abuse and exposure to violence, coded from administrative data, were used to predict measures of anxious/ depressed symptoms. A hierarchical regression model revealed that at the first step, severity of physical abuse contributed significantly to parent ratings of anxious/depression, $F(1, 49)= 10.941, p=.002$ and accounted for 18.6% of the variation in anxious/depressive symptoms in children. When adding violence exposure to the regression model, it explained an additional 7% increase of the variation in ratings of depression/anxiety and this change in $R^2$ was significant, $F(1, 49)= 4.352, p = .04$. When examining teacher ratings of anxious/depressed scores, severity of physical abuse was not a significant predictor, $F(1, 34)= 2.256, p =.142)$. However, when adding violence exposure to the model, it explained 16% of the variation in ratings of depression/ anxiety and this change in $R^2$ was significant, $F(1, 34)= 3.994, p =.05$. The findings suggest that violence exposure may add to the prediction of mental health outcomes and to the experience of physical abuse.

410  Poster #38
Examining Acceptance of Violence Beliefs, and Family and Peer Factors in Relation to Teen Relationship Violence
Remington Gonzalez, Child and Family Development (M)
Audrey Hokoda, Child and Family Development

Teen relationship violence (TRV) is a serious problem that is associated with numerous negative consequences that include depression, substance abuse, poor school performance, and post-traumatic stress disorder (Centers for Disease Control, 2013). Researchers examining risk factors associated with TRV have focused on individual factors (e.g., acceptance of violence beliefs) and family factors (e.g., exposure to interparental conflict, harsh parenting), but fewer studies have examined peer influences (i.e., peer norms) in addition to these individual and family factors over time. Two hundred and four participants (93 boys, 111 girls) were recruited from 7th, 9th, and 11th grade classes in a middle and high school in south San Diego County. Students ranged in age from 12 to 17 years; and 75% were Latinos. They completed surveys twice over a 10-month period; surveys assessed perpetration of TRV, acceptance of couple violence beliefs, exposure to interparental conflict, exposure to harsh parenting and peer norms of couple violence. Regression analyses revealed that peer norms and harsh parenting were significant predictors of TRV 10 months later. Implications for school-based prevention programs targeting educators and parents of ethnically diverse middle school and high school-aged youth are discussed.

Session A-16
Poster: Influence of Culture
Friday, March 4, 2016, 9:00 am – 10:30 am
Location: Mozntezuma Hall

412  Poster #40
Pregnant Service Women Effecting the Moral in the U.S Armed Forces
Dominique Holton, Psychology (U)
Antwanisha Alameen, African Studies

This study investigated the current temperament of the women and men affected by pregnancy in military commands. This study hypothesized that service women and men would agree that pregnant servicewomen causes a negative environment in the military work centers effecting the morale of the military command. One hundred and fifty-two military service members completed an anonymous online Qualtrics survey. The results indicated that there is not significance difference in the views of pregnant service women effecting the moral of the military
commands. This study provides evidence that pregnancy in the military cause conflict due to laws and regulations that prohibit pregnant service women from deploying or working in any hazardous work centers. These findings have implications for supporting the Department of Defense laws and regulations on active duty pregnant servicewomen, and acknowledging the impact pregnancy has on the women and men in the military. Future research is needed to improve the moral among men and women when pregnancy becoming a topic in the military units.

413 Poster #41

Residents’ Views Toward Nature and Their Engagement in Sustainable Lifestyle Behaviors: A Comparison between Ecuador and Southern California

Annemarie Carignan, Sustainability (U)
Vinod Sasidharan, Hospitality and Tourism Management

This study examined the relationship between residents’ views toward nature from various regions in Ecuador and Southern California, US, and their engagement in sustainable lifestyle behaviors. Sustainability has become a global concept; yet, it can be approached differently depending on a multitude of factors. Research has shown that what constitutes actively living a sustainable lifestyle varies between countries, regions and cultures. Studies have also shown that cultural values can greatly influence how one views nature, whether it be through an anthropocentric (human-centered) or ecocentric (nature-centered) lens, or both. This study proposed that there is a relationship between how residents view nature and the behaviors in which they participate. The more ecocentric a resident is, the more likely they are to participate in specific sustainable behaviors while the more anthropocentric a person is, the less likely they are to participate in those same behaviors. Furthermore, residents are more likely to hold an ecocentric view of nature if they are from rural regions while residents from urban regions are more likely to hold an anthropocentric view. This study focused on rural and urban population samples of communities in Ecuador and Southern California. Data was collected through a self-administered survey consisting of the New Ecological Paradigm scale to gauge resident’s views toward nature; it also included a series of questions that examined participation in sustainable behaviors. Findings determined that there is no statistically significant relationship between how residents view nature and the behaviors in which they participate; however, residents with an ecocentric view of nature were more likely to participate in specific sustainable behaviors. In addition, rural residents were more likely to participate in sustainable behaviors than urban residents and residents from Southern California were more likely to have an ecocentric view of nature than residents of Ecuador.

Based on the results of this study, a larger sample size could showcase a stronger connection between residents’ views toward nature and the behaviors in which they participate. It is important to further explore the connections as these findings can help establish more suitable approaches to educating people of all different backgrounds about living sustainably.

414 Poster #42

Risk, Resilience, and Countercultural Beliefs in Homeless Youth

Jennie Buss-Gregory, Social Work (M)
Ijeoma Ogbonnaya, Social Work

The present study has sought to fill gaps in the homeless youth literature around factors for resilience in homeless youth and countercultural beliefs among homeless youth. The literature contains some qualitative studies on resilience (Bender, Thompson, McManus, Lantry, & Flynn, 2007; Kidd, 2003; Rew & Horner, 2003) as well as a few quantitative studies on resilience (Cleverley & Kidd, 2011; Rew, Taylor-Seehafer, Thomas, & Yockey 2001); however, the quantitative literature on resilience is lacking. Also, there are a few articles that touch on concepts related to countercultural beliefs among homeless youth (Kidd & Davidson, 2007; Bender et al., 2007), but these are few in number and all of them are qualitative in nature. To this end, resilience and countercultural beliefs have been examined quantitatively in the present study. Since a scale for resilience that has been used extensively with homeless youth doesn’t exist, adaptive coping, social support, and mental health service utilization were hypothesized factors for resilience that were tested on depression outcomes. Also, the qualitative literature that touches on countercultural beliefs was used to construct statements about countercultural beliefs (Bender et al., 2007; Kidd & Davidson, 2007). These statements were rated on Likert scales, strongly agree to strongly disagree, to assess the extent of countercultural beliefs among homeless youths. This strategy was used in the absence of a valid or reliable scale to assess levels of countercultural beliefs. It was hypothesized that adaptive coping, social support, and mental health service utilization would predict less depression, and that these factors could possibly point to resilience. It was also hypothesized that countercultural beliefs would predict more depression. As a result, only female gender and alcohol use predicted depression outcomes, and only some college education or above predicted less depression. Future explorations of resilience and countercultural beliefs are discussed.
Proprioception is the muscle sense of the relative position and adapt to sensory feedback, including proprioception. Articulatory movements are made to produce a desired acoustic pattern and speakers respond and adapt to sensory feedback, including proprioception. Proprioception is the muscle sense of the relative position of neighbouring parts of the body and strength of effort being employed in movement (Konczak et al., 2009). Theoretically, individuals with better proprioceptive skills will have better speech production. Understanding lingual proprioceptive skills may provide insight for assessment and interventions targeting speech production in individuals with speech deficits.

Our current study looks to examine proprioceptive sensory feedback of the tongue and how it affects speech production in 8 typically-developing (TD) young female adults. Participants have no history of speech, language, cognitive, hearing, or neurological disorders. Participants were asked to come into the Speech Physiology Lab at SDSU for a total of 2 hours. Testing included kinematic recording using electromagnetic articulography (WAVE system, Northern Digital). Seven small wired sensors (sterilized with medical-grade disinfectant) were placed on each participant’s head, upper jaw, lower jaw, tongue tip, and on the body of the tongue using FDA-approved dental glue. Participants were asked to produce two position matching tasks executed with mouth open at a consistent 5 cm. In the first task, a reference position is initially provided to the participant for several seconds. Then, participant is prompted to return to the “start” position. The participant is asked to replicate the previously experienced reference position unassisted (Goble, 2010). Participants were asked to produce the sentence “Dad told stories today.” Audio recording, aligned with kinematic data, will be used to identify the tongue movements associated with each sentence. Kinematic data will be analyzed in Matlab to obtain measure such as movement distance (mm), speed (mm/s), and duration (s). Kinematic signals from different articulators (e.g., tongue tip and jaw) will be cross-correlated to obtain measure of interarticulator coordination (Nip, in press). Discussion will center around understanding lingual proprioceptive information during speech production, potentially providing researchers and clinicians insight into more specific assessment and treatment techniques.
ABSTRACTS

STUDENT RESEARCH SYMPOSIUM 2016

Student Level: (U)=Undergraduate; (M)=Masters; (D)=Doctoral

The purpose of this project is to examine the effectiveness of a community-based approach to preschool education with a focus on language and literacy. We share both the results of implementing our Integrative Preschool Model Intervention and the general lessons we have learned implementing CBR. Given that preschool programs emphasizing language stimulation techniques and incorporating speech language pathologists have been shown to improve language abilities of at risk children (Justice, Mashburn, Pence & Wiggins, 2008), we expect language gains.

Over the 5-year period, a total of X preschool children, their families, and their teachers participated. The children come from homes of varied language backgrounds with mostly Spanish spoken at home and parents of low education levels. Our Integrative Preschool Model includes early speech/language screenings, educator and speech language collaborations, language focused curriculum, and caregiver involvement.

During year one, an experimental and control model was used to determine whether our Integrative Preschool Model showed gains compared to the general instruction of the control classroom. After demonstrating that the children in the experimental classroom had greater gains, the model was implemented in additional classrooms each coming year.

The data suggest that integrating community resources leads to positive results for “at-risk” students. Furthermore, the results support previous work that partnerships between SLPs and preschool educators lead to high-quality preschool language-learning environments. The broader gains of the project also support CBR within the field of communicative disorders.

418 Poster #46

Pronoun Processing: Eye Tracking of Individuals with Broca’s Aphasia

Valeria Garcia, Speech Language and Hearing Sciences (U)
Tracy Love, Speech Language and Hearing Sciences

Aphasia is a language disorder that results from damage to the left hemisphere, typically due to stroke. The current study focuses on a subtype of aphasia, Broca’s aphasia, which is characterized by non-fluent, halting or telegraphic speech production. Individuals with Broca’s aphasia (IWBA) also demonstrate comprehension difficulty with certain sentence types including Wh-questions, passives, and object-extracted constructions (Grodzinsky, 1990; Caramazza & Zurif, 1976; Swinney & Zurif, 1995; Drai & Grodzinsky, 2006). These sentence types are examples of long-distance dependencies where a listener must link two non-adjacent elements in order to understand the meaning of the sentence. Another example of long distance dependencies comes from sentences containing proforms such as him/her and himself/herself.

Several studies have investigated proforms in IWBA with varied results. Some studies have found impairment in personal pronoun comprehension only (Grodzinsky et al., 1993), others have found impairment in comprehension of both proforms (Love et al., 1998; Edwards & Varlotska, 2007; Choy & Thompson, 2010), and one study found no comprehension impairment (Bos & Colleagues, 2014). Real-time processing studies have also been met with mixed results. One study shows abnormal online processing of pronouns (Love et al., 1998), while another shows non-impaired processing of both proforms (Choy & Thompson, 2010).

Due to inconsistent results across previous studies and the scarcity of studies that measure real-time language processing, the current study investigates the processing of sentences containing reflexive and personal pronouns in IWBA (n=9) as compared to unimpaired controls using an eye-tracking while listening (ETL) method. Participants are presented with auditory sentences such as:

1a. The cowboy yelled that the sheriff scratched himself.
1b. The cowboy yelled that the sheriff scratched him.

while they look at a 4-figure picture display (see Figure 1). This online ETL study allows us to gain a better understanding of sentence processing with pronouns and reflexives in IWBA. These results provide insight into the real-time consequences of stroke and resulting Broca’s aphasia. Preliminary results suggest that processing of sentences containing reflexives mirror those of the control group, while processing of pronouns demonstrate a temporal delay relative to controls.

419 Poster #47

Word Learning from Context: School-Aged Children with Typical and Atypical Language

Jasmine Guantez, Speech, Language, and Hearing Sciences (U)
Alyson Abel-Mills, Speech, Language, and Hearing Sciences

Most children acquire language quickly and with relative ease. A subset of children have sustained difficulty with language learning, however, and are considered to have language impairment (LI). More specifically, children with Speech Language Impairment (SLI) show delayed language abilities, but maintain normal cognitive abilities. In comparison, children with Nonspecific Language Impairment (NLI) have trouble with both language and cognitive tasks. There is a surprising lack of
Recent research suggests that bilingualism may have benefits beyond cross-cultural communication. Bilinguals often outperform monolinguals on word learning and inhibition tasks, but it is unclear whether these strengths translate to other domains of learning. Blumenfeld and Adams (2014) found that bilinguals and monolinguals employ inhibitory control differently during nonlinguistic auditory-visual matching. Using this task, our research employs tones corresponding to visual symbols to investigate learning and inhibitory control in bilinguals and monolinguals. We hope to determine whether bilingualism influences symbolic learning and inhibitory control by training participants on tone-visual pairs, and tracking their eye-movements during processing. This paradigm takes advantage of the uniqueness point in spoken language, the point at which a distinguishing phonetic cue reveals the unique word.

A 2x3x2 factorial design created a symbolic system including tone quality (sine wave, square sine wave), pitch (160 Hz, 440 Hz, 720 Hz) and tone length (1000ms, 400ms). These were presented in images through color (black, grey), bar height (low, medium, high), and bar length (long, short) respectively. Sixteen monolinguals and 17 bilinguals each learned 12 tone-visual stimulus pairs. Prior to the task, participants partook in a training session and achieved an average accuracy post-training of 81.2% (SD = 6.5) for monolinguals and 78.0% (SD = 6.3) for bilinguals. Through a Visual World eye-tracking paradigm, participants then viewed a target (e.g. a low-long-black stimulus), competitor (e.g. a low-short-black stimulus), and two unrelated fillers upon hearing the auditory stimuli. Initial findings reveal a competition effect similar to auditory word recognition. The competition resolution time course shows fine-grained differences in how the groups resolve competition and future research will examine these differences. A main effect was observed (p = .004) regarding reduced accuracy at identifying the target with a competitor present (81.6%) versus a target with no competitor (83.7%). Both groups showed similar patterns in learning and processing tones. While bilinguals may have advantages learning a linguistic system (Kaushanskaya, 2012), these did not translate to learning our non-linguistic system, and only subtle group differences were present during subsequent processing.

**420** Poster #48

**Symbolic Learning and Inhibitory Control in Monolinguals and Bilinguals: A Visual World Study**

Megan Jeong, Speech, Language, and Hearing Sciences (U)
Henrike Blumenfeld, Speech, Language, and Hearing Sciences

Recent research examining how children with LI learn new words by using only the surrounding linguistic context, a familiar process to most school-aged children with typically-developing language (TD). This study examined how children with LI compare to children with TD in learning words through context. Participants in this study included 27 monolingual English school-aged children (10F, 17M). Criteria for SLI included low language abilities but cognitive abilities within age-expectations. Criteria for NLI included low language abilities and cognitive abilities below age-expectations. Children in the LI groups had no identified causal factors for their low abilities (i.e., ASD, ADD, etc.). TD children were within age-expectations on both language and cognitive measures. All participants completed a Word Learning from Context task in which children silently listened to sets of three sentences where the final word of each sentence was the target novel word to be learned. Sentence triplets comprised two conditions: Meaning (M+) and No Meaning (M-). The M+ condition was designed to establish meaning for the novel word and the M- condition served as a control for repeated exposure to the target without establishing meaning for the target word. Each sentence set was followed by a test question (“what does the word mean?”) with responses recorded by a research assistant sitting in the room with the child. A 3 group (SLI, NLI, TL) x 2 condition (M-, M+) repeated measures ANOVA (RMANOVA) will examine differences in word learning ability based on language level and cognitive ability. The discussion will focus on group differences in children’s ability to correctly assign a meaning to a word but also to recognize when they don’t know the meaning for a word.

**421** Poster #49

**The Neural Underpinnings of Word Learning from Context Through Repeated Exposure**

Chanel Konja, Speech, Language, and Hearing Sciences (U)
Alyson Abel-Mills, Speech, Language, and Hearing Sciences

Most studies of word learning use behavioral learning measures, which assess the final stage of learning, or children’s overt indication of whether they know the word’s meaning. These methods can’t capture nuances in the word learning process, however. A solution to understanding important differences in the word learning process is to use electroencephalogram (EEG) measures, which can index incremental changes in unconscious levels of processing as a word moves from unknown to known without requiring overt behavioral responses. Based on the EEG signal, Event Related Potentials (ERPs) are one means of looking at a response to stimuli. The N400 ERP component is considered an index of lexical and semantic processing (Kutas & Federmeier, 2000) and has been shown to be sensitive to word learning. Specifically, Mestres-Missé et al. (2008) found that the N400 amplitude attenuates with repeated exposure to a novel word in a meaning-supportive context, indicating word learning in adults. This study expands on previous work by looking at changes in the N400 amplitude during word learning in typically developing school-aged children. Monolingual English, right handed,
A Case Study of Two Bilingual Children

Dual Language Interaction in Speech Production: A Case Study of Two Bilingual Children
Rylee Umstead, Speech, Language, and Hearing Sciences (U)
Jessica Barlow, Speech, Language, and Hearing Sciences

According to the Digest of Educational Statistics (2008), in Fall 2006, 21% of students in United States public elementary schools were Hispanic. As this number continues to grow, so does the number of Spanish-English bilingual children. This has created an increasing need for speech-language pathologists to study each language’s sound system in order to distinguish phonological variation from disorder (Goldstein, 2001). In this case study, we consider cross-linguistic interaction at the phonological level by examining variable production of consonant clusters such as /tw-/ or /-kt/. Given the asymmetrical distribution of permissible cluster types in Spanish and English, we expect to find different accuracy levels for clusters which occur in both languages as compared to those which occur in only one.

The participants of interest in the case study are two typically developing Spanish-English bilingual preschool children aged 57 and 65 months, who, on average, have heard and spoken more Spanish than English at home. Parents reported that, at home, both children heard 60% Spanish and 40% English, and spoke 80% Spanish and 20% English.

Data were collected through spontaneous language samples during play, and then transcribed and analyzed using Phon (Rose, Y. & Hedlund, 2015), a phonological analysis and database software. After running an analysis through Phon, we can observe all the consonant clusters the children produce, while evaluating accuracy in both the overlapping and non-overlapping consonant clusters of Spanish and English.

We predict cross-linguistic interaction between the children’s two language systems will affect consonant cluster production patterns. Variations in accuracy across shared and unshared cluster types could suggest the natural influence of two language systems interacting in bilingual development. Because of their unique language profiles, accurate assessment and efficacious treatment in bilinguals must account for any potential language interaction. Future studies could distinguish between individual variation and dual language interaction by increasing the number of participants and comparing them to monolingual controls. Studies that include children with a variety of age ranges and language backgrounds could provide additional insight into assessment and treatment of speech-sound disorders in other groups of bilingual speakers.
An ANOVA was performed with child code-switching as the dependent variable and age (31 or 39 months) and language (English or Spanish) as the independent variables. Preliminary results revealed a significant effect of language ($F(1, 35)=26.05$, $p<.001$, $\eta_p^2 = .43$) and a language by age interaction ($F(1, 35)=4.71$, $p=.037$, $\eta_p^2 = .12$, see Figure 1). A second ANOVA was performed with maternal code-switching as the dependent variable and child age and language as independent variables. There was a significant effect of age ($F(1, 35)=8.69$, $p=.006$, $\eta_p^2 = .20$, see Figure 2) but no effect of language. There was no significant correlation between English and Spanish code-switching and vocabulary size in each language, total conceptual vocabulary, and number of known translation equivalents across the MCDI and PPVT (all n.s. $p > .18$).

Together, these preliminary results demonstrate developmental changes in children's code-switching behavior between 31 and 39 months. This change is modulated by language, as code-switching decreased over time in English, but increased in Spanish. However, maternal code-switching did not show significant change over time in either language. In addition, results suggest that code-switching has no relation to proficiency, consistent with findings in younger children (Bail et al., 2014). We plan to present a final sample of 20 bilingual toddlers.

**Poster #52**

**Patterns in English morpheme use by preschool-aged Spanish-speaking English Language Learners**

Aizel Agustino, Speech, Language, and Hearing Sciences (M)
Sonja Pruitt-Lord, Speech Language and Hearing Sciences

Much is known about language acquisition in monolingual English-speaking children, and these well-established patterns have allowed speech-language pathologists (SLPs) to identify atypical patterns associated with language disorders in children. For example, monolingual English-speaking children with language impairment are known to struggle with tense and agreement morphemes, including the third person singular (-3s, *walks*), past tense (-ed, *walked*), auxiliary DO, copula BE and auxiliary BE. In contrast, relatively little is known about typical language development trajectories for children learning English as a second language. In fact, establishing such baselines for this population is difficult, as children with dual-language experience are a highly heterogeneous group with major differences for factors that are known to impact language development (e.g., amount of exposure to each language).

Understanding morphological development in typically-developing English Language Learners (ELLs) will improve practices in identifying language disorders in multilingual populations. Thus, the present work investigated patterns in preschool-aged Spanish-speaking ELLs' morpheme use by analyzing the children’s utterances during play samples conducted at the beginning and end of an academic year. The play samples were transcribed and analyzed using traditional language sample measures (e.g., mean length of utterance), as well as a novel scoring system that has been shown to capture morphological development in monolingual English speakers (Hadley & Short, 2005; Gladfelter & Leonard, 2013).

Results indicate that the novel measure 1) captured significant growth in morpheme use over the course of an academic year, and 2) were positively associated with traditional language sample measures. This novel approach also captured higher scores for some morphemes (e.g., copula and auxiliary BE) than others (e.g., auxiliary DO), a pattern that differed from previous findings in English-speaking monolingual children (e.g., Hadley & Short, 2005; Gladfelter & Leonard, 2013). Ongoing analyses are thus considering each child’s individual performance, morpheme mastery and adherence to the group pattern of morpheme use. Overall, this research illuminates typical patterns of morpheme use in Spanish-speaking ELLs, contributing to a knowledge base necessary for evaluating language in diverse populations.

**Poster #53**

**Bilingual advantage? Comparison of monolingual English, Spanish and bilingual toddlers**

Yushuang Liu, Psychology (M)
Margaret Friend, Psychology

Existing literature suggests that bilingualism enhances the efficiency of executive function (EF). Bilinguals typically display heightened performance on tasks involving conflicting attentional demands, but not on response suppression tasks (e.g., Carlson & Meltzoff, 2008). It is posited this advantage results from the simultaneous activation of two languages in the bilingual brain (e.g., Colomé, 2001). Poulin-Dubois et al. (2011) reported that this effect emerges as early as 24 months of age. Recently, Crivello et al. (2016) found that this advantage in 30-month-old French-English bilinguals was tied to growth in translation equivalents (TEs): two lexical representations for a single referent (e.g., car and coche). We are interested in whether this effect of TE growth on EF extends to Spanish-English bilinguals at the same age.

Toward this aim, vocabulary size and TEs were assessed using the MacArthur-Bates Communicative Development Inventory: Words and Sentences (Fenson et al., 1993) at 23 and 30 months. Two EF tasks (conflict: shape stroop; inhibition: gift delay) were administered at 30 months in the child’s dominant language. Preliminary analyses included 27 bilingual and 59 English and 23 Spanish monolingual children. Since socioeconomic status
Dual language immersion school administrators reported school culture issues and socio-political tensions exist between immersion and non-immersion personnel. The findings indicated that as immersion programs grow funding needs for campus facility enhancements, other resources and support i.e., professional development do not follow. The study also found that there are more dual language immersion school administrators who are bilingual in two or more languages than those who are monolingual. Dual language administrators report their programs need highly qualified, bilingual teachers who are qualified to teach dual language immersion classes. These administrators purport a need for greater support from district personnel. Finally, they reported the lack of non-existent local and federal accountability alignment to dual language immersion programs.

Session B: Poster Presentations

Session B-9
**Poster:** Catalysis 2
**Date:** Friday, March 4, 2016, 10:45 am – 12:15 pm
**Location:** Montezuma Hall

**426 Poster #54**
**Dual Language Immersion Program Equity and Access: Is there equity for all students?**
Patricia Fernandez, Educational Leadership (D)
Cheryl James-Ward, Educational Leadership

This is a mixed methods study that investigated school administrators who have lead dual language immersion programs in the United States. Data were collected using open and closed-ended survey questions and interviews. Total pool were 498 school administrators with K–12 leadership expertise leading dual language immersion programs in the United States. Of that number, 132 responded.

Dual language school administrators were initially identified from a web-based directory, titled Center for Applied Linguistics Directory of Two-Way Bilingual Immersion Programs in the United States. Data collection spanned five weeks. Survey data was collected via online survey link and by interview. The study analyzed characteristics of dual language immersion schools and the communities where such programs are located. The paramount research focus was to identify equity and access issues in grades K-12 dual language immersion programs in the U.S., as identified by school administrators who have led such programs.

The following conclusions emerged from this research study. Dual language immersion programs tackle equity and access challenges; funding challenges; staffing challenges; social political tensions; collaboration challenges; resource challenges; policy and accountability challenges.

**427 Poster #1**
**Exploration of Naphthyridine Pendant Base Assisted Water Oxidation Catalysts**
Ryan Shirey, Chemistry (U)
Douglas Grotjahn, Chemistry and Biochemistry

Efficient methods of capturing, storing and utilizing renewable energy are needed to satisfy increasing global energy demand in an environmentally sustainable way. The sun provides more than enough radiation to satisfy this demand but modern batteries aren’t a sustainable method of containing that energy on the scale required. The chemical bonds in hydrogen gas store a higher energy density than do modern batteries and burn cleanly to produce water. Water is the ideal source for generating hydrogen gas; however the process is inefficient due the large over potential required to oxidize water. Water oxidation catalysts have the capacity to increase solar fuel cell efficiency by lowering this barrier. Ruthenium catalysts have been shown to catalyze water oxidation, yet more exploration is needed to broaden the current understanding. In 2011, Thummel’s group synthesized the proximal (p) and distal (d) stereoisomers of [Ru(tpy)(pynap)OH₂]²⁺. The p isomer was unique because the ligand architecture contains a naphthyridine ring with an ability to act as a pendant base due to the proximity to the active site, which may assist...
in the deprotonation of the water substrate and thus lower the kinetic barrier for the reaction. Despite the potential for this concept to yield a better catalyst, testing by Thummel’s group revealed likely decomposition and catalyst failure under water oxidation conditions. In 2013 Masayuki Yagi’s group published DFT calculations revealing LUMO density on the naphthyridine ring system which suggested a route for decomposition. In an attempt to shield the atoms with large LUMO coefficients, a diverse ligand library was generated with large substituents such as 2,6-bis(trifluoromethyl)phenyl, 2,4-bis(trifluoromethyl)phenyl, 2,4,6-trimethyl phenyl, and 2,6-(3,5-di-trifluoromethyl)phenyl to modify the original ligand system. The eight catalysts were evaluated by cyclic voltammetry and transducing pressure sensors to obtain turnover frequency and turnover number. Contrary to the proposed hypothesis, the p isomers were not effective catalysts; hence either the sign 8 years the Grotjahn lab 8 years the Grotjahn lab ificant bulk of the shielding substituents were insufficient, or nucleophilic attack on the ring system is not initiating the decomposition. This surprising result is a great step towards understanding ligand stability and prompts investigation into alternative pathways for ligand decomposition.

**429 Poster #3**

**Bifunctional Catalyzed Sulfenylation of Biologically Active Aromatic Compounds**

Eric Miller, Biochemistry (U)
Jeffrey Gustafson, Chemistry

Organosulfur compounds are ubiquitous in the natural product and drug discovery world. In fact, in 2011, 9 of the 15 top selling small molecule drugs contained at least one Sulfur. Herein we present a bifunctional catalyst that can catalyze the sulfenylation of electron rich aromatic compounds. Through an optimization study we developed a series of novel bifunctional catalysts capable of effecting this reaction in the absence of acid or elevated temperature that is usually required. These mild conditions have allowed an incorporation of functionalities (R group off the Sulfur) onto scaffolds that are ubiquitous throughout chemistry and biology. We feel these studies prove useful in the field of natural product mode of action studies, where recently discovered natural products with promising activities are often complex and only available in milligram quantities. In these cases our catalysts will allow the incorporation of moieties such as biotin or an alkyne through a C-S bond in one step.

**430 Poster #4**

**Distinct Catalytic Strategy of Bacterial-Specific GTP Cyclohydrolase I**

Naduni Paranagama, Biochemistry (M)
Manal Swairjo, Chemistry and Biochemistry

The GTP cyclohydrolase type I enzymes catalyze the first step in folic acid biosynthesis in bacteria and plants, bipterin biosynthesis in mammals, and the biosynthesis of 7-deazaguanosine modified tRNA nucleosides in bacteria and archaea. We recently reported the discovery and crystal structure of a new, bacterial-specific GTP cyclohydrolase I enzyme (denoted GCYH-IB) that is found in a number of pathogens, including the clinically important Staphylococcus and Neisseria where it is essential. GCYH-IB is structurally distinct from the canonical GCYH-IA enzyme involved in bipterin biosynthesis in humans and animals, thus it poses as an attractive potential antibacterial drug target. Here we report the crystal structure of GCYH-IB of Neisseria gonorrhoae (N. gonorrhoae), bound to the substrate analog/ transition-state inhibitor 8-oxo-GTP. The structure reveals a mode of binding for the
substrate ribose moiety that is distinct from that seen in GCYH-IA. Most strikingly, the ribose interacts via its 2’ hydroxyl with the sulfur atom of a posttranslationally S-nitrosylated active site cysteine, Cys149, the second cysteine in the strictly conserved CPC motif characteristic of type IB GTP cyclohydrolases. This is the first structural observation of an SNO-modified Cys in any bacterial enzyme and was confirmed in pure enzyme preparations using the iodotMT-switch assay. Site directed mutagenesis of Cys149 to Ala or Ser abolished enzyme activity, confirming its role in catalysis. The results reveal a distinct catalytic strategy used by GCYH-IB and suggest a distinct catalytic mechanism, further enhancing the potential of GCYH-IB as a drug target.

431  Poster #5
Effect of Cyclopentadienyl Ligands on Alkene Isomerization Catalysts
Patrick Brklycica, Chemistry/Biochemistry (U)
Douglas Grotjahn, Chemistry
In the past 8 years the Grotjahn lab has explored the scope of catalyst 1 (R = H) that turns a 1-alkene into (E)-alkenes, with very high selectivity. In the past two years we discovered that catalyst 1 (R = Me) that can turn a 1-alkene into a (E)-2-alkene, without making more than 1 or 3% 3-alkene or other isomers; 2 in other words, 1 (R = Me) selectively moves the double bond only once. While the existing examples of 1 are very successful at (E)- and positionally selective isomerizations, we would like to expand our toolbox to achieve other selectivities; results of these studies will be reported here.

432  Poster #6
Precariously balanced rocks (PBRs): first attempt to establish their textural, physical, and chemical properties
Craig Hall, Geology (M)
Gary H. Girty, Geology
Between the Elsinore and San Jacinto faults, residual regolith includes saprock partially to completely incircling meter-scale ellipsoidal to spheroidal corestones, and thin overlying eroded soils. During exhumation, saprock and soil are removed, resulting in a precariously balanced corestone poised on a base of jointed basement rock. One such example occurs near Roundtop where published cosmogenic ¹⁰Be data suggest exhumation ~35,000 years ago. Little work exists on establishing the textural, physical, and chemical properties of PBR. Hence, it is possible that their absence adjacent to bounding faults, may reflect a more highly fractured and intensely weathered terrane, as opposed to the idea that they were shaken free from their perches during ground shaking. Three cores were taken from: (1) a highly fractured portion of the PBR in which clay and pedogenic silica lined fractures are evident, (2) a relatively unfractured part of the PBR, and (3) from the underlying platform on which the PBR rested. In addition, 6 saprock and 9 cylindrical samples of soil were extracted from a trench extending from the platform of the PBR, ~ 2 m to the south. For every meter of core, ~10 cm of material was removed for geochemical, bulk and grain density, porosity, and thin section analysis. Similar analyses were carried out on the saprock samples. Clay, mineralogy, compositional linear modeling, assessment of an immobile element framework, volumetric strains, and mass balance calculations of changes in bulk and elemental mass have been completed. Overall, our observations of clay and pedogenic silica lining fractures in the more highly cracked portion of the PBR along with its greater porosity implies that the PBR was exhumed intact, and that since exhumation little additional fracturing has taken place. Additionally, plagioclase alteration is the primary control on weathering intensity as it varies over the different textural components of the PBR, saprock, and soil. Such alteration produced abundant kaolinite, and likely did not occur in the generally dry climate of the Holocene. Hence, our data support the general idea that Roundtop is an area of weak ground shaking, and that since exhumation little weathering has affected this PBR locality.

433  Poster #7
Structural Architecture of the Western Transverse Ranges and Potential for Large Earthquakes
Yuval Levy, Geophysics (D)
Thomas Rockwell, Geology
Understanding the subsurface structure of the Western Transverse Ranges is critical to assess the seismic potential of large thrust faults comprising this fold-and-thrust belt. Several models have been advanced over the years, building on new data and understandings of thrust belt architecture, but none of these efforts have incorporated the full range of data, including style and rates of late Quaternary deformation in conjunction with surface geology, sub-surface well data and offshore seismic data. In order to resolve the structure we plan to build a comprehensive 3D geologic model, and use methods of retro deformation in order to resolve the deep structure, while taking into account the time of formation of the observed structures. Our preliminary model is of ramp flat structure that evolved with time. We suggest that the nearly continuous backbone with continuous stratigraphy of the Santa Ynez Mountains is explained by a large anticlinorium.
that was formed by a deep thrust fault, and that the thrust front propagated south with time, from the San Cayetano fault to the Red Mountain fault and eventually to the currently active thrust front, which is defined by the southward-vergent Pitas Point-Ventura fault. This model implies that large earthquakes may extend the entire length of the anticlinorium from Point Conception to eastern Ventura Basin, suggesting that the potential for a large earthquake is significantly higher than previously assumed.

434 Poster #8
Intra-event and Inter-event Ground Motion Variability from 3-D Broadband (0-8 Hz) Ensemble Simulations of Mw 6.7 Thrust Events Including Rough Fault Descriptions, Small-Scale Heterogeneities and Q(f)
Kyle Withers, Geophysics (D)
Kim Olsen, Geosciences
We model blind thrust scenario earthquakes matching the fault geometry of 1994 Mw 6.7 Northridge earthquake up to 8 Hz by first performing dynamic rupture propagation using a support operator method (SORD). We extend the ground motion by converting the slip-rate data to a kinematic source for the finite difference wave propagation code AWP-ODC, which incorporates an improved frequency-dependent attenuation approach. This technique has high accuracy for Q values down to 15. The desired Q function is fit to the ‘effective’ Q over the coarse grained-cell for low Q, and a simple interpolation formula is used to interpolate the weights for arbitrary Q. Here, we use a power-law model Q above a reference frequency in the form Q = Q0 f^n with exponents ranging from 0.0-0.9. We find envelope and phase misfits only slightly larger than that of the elastic case when compared with that of the frequency-wavenumber solution for both a homogenous and a layered model with a large-velocity contrast. We also include small-scale medium complexity in both a 1D-layered model and a 3D medium extracted from SCEC CVM-S4 including a surface geotechnical layer (GTL). We model additional realizations of the scenario by varying the hypocenter location, and find that similar moment magnitudes are generated. We observe that while the ground motion pattern changes, the median ground motion is not affected significantly, when binned as a function of distance, and is within 1 interevent standard deviation from the median GMPEs. We find that intra-event variability for the layered model simulations is similar to observed values of single-station standard deviation. We show that small-scale heterogeneity can significantly affect the intra-event variability at frequencies greater than ~1 Hz, becoming increasingly important at larger distances from the source. The intra-event variability of our simulations in the CVM is typically larger than that for the observations at frequencies > 1 Hz. However, this discrepancy tends to decrease when small-scale heterogeneity in the medium is included in the simulations, suggesting the need for a highly complex velocity model to fit ground motion variability.

435 Poster #9
Dynamic Fault Weakening and Strengthening by Gouge Compaction and Dilatancy in a Fluid-Saturated Fault Zone
Evan Hirakawa, Geophysics (D)
Shuo Ma, Geological Sciences
Fault gouge deformation likely plays an important role in controlling the strength of mature, large-displacement faults. Experiments show that intact gouge deforms in an overall ductile and stable manner, readily compacting by comminution and structural collapse, but it dilates and experiences brittle failure under large strain rate. We model gouge compaction and dilatancy using a combined Mohr-Coulomb and end-cap yield criterion in a dynamic rupture model of a strike-slip fault with strongly velocity-weakening friction (in a rate-and-state framework). We show that large shear stress concentration associated with the rupture front causes the gouge layer to compact ahead of the rupture, leading to rapidly elevated pore pressure in the undrained gouge layer and significant weakening of the principal fault surface. Weakening ahead of the slipping region lowers frictional strength and strength drop on the fault. Shortly after the rupture front passes, strong dilatancy during strength drop and rapid sliding reduces pore pressure and strengthens the fault, promoting slip pulses. Large strain localization occurs as a result of rapid gouge dilatancy and strain softening, and strongly limits the stress concentration outside the gouge layer. This leads to negligible inelastic shear strain in the damage zone which is consistent with geological observations and high-speed frictional experiments, and suggests that current dynamic rupture models incorporating inelastic offset-fault response may overestimate the effect of offset-fault damage. With the presence of well-developed fault gouge the strength of mature faults may be controlled by end-cap, rather than Mohr-Coulomb failure, thus their frictional strengths are significantly smaller than Byerlee friction.

436 Poster #10
Toward A Kinematic Rupture Generator Based on Rough Fault Spontaneous Rupture Models
William Savran, Geophysics (D)
Kim Olsen, Geological Sciences
As the frequency limit of deterministic strong-ground motion simulations approach engineering relevant frequencies (>10 Hz), finite-fault source models with realistic small-scale rupture complexity become increasingly important. Spontaneous rupture modeling provides a physical framework to compute realistic broadband rupture models of earthquake faults. However, at this time, it is numerically unfeasible to use spontaneous rupture simulations directly for the large number of strong-ground motion simulations necessary for current seismic hazard projects (e.g., CyberShake, the Broadband Platform). Instead, we aim to capture
the statistics of complex spontaneous rupture models in a method allowing for rapid and computationally inexpensive generation of physically realistic broadband kinematic source models. We present our progress toward this method using 3D spontaneous rupture modeling on a vertical strike-slip rough fault geometry in a layered crustal model. The statistics for the method is derived based on ensembles of rupture models that compare favorably to GMPEs.

Session B-11
Poster: Left Ventricular Assist Devices and Carotid Compression
Friday, March 4, 2016, 10:45 am – 12:15 pm
Location: Montezuma Hall

Poster #11
Reduction of Stroke Risk from Embolic Shower Following Cardiac Surgery Using Carotid Compression
Paul Isingoma, Bioengineering (M) Karen May-Newman, Mechanical Engineering

Every year over 500,000 cardiovascular surgical procedures requiring cardiopulmonary bypass (CPB) are performed in the United States. Unfortunately, these procedures have been found to produce clinical, subclinical and silent neurologic injuries. The cause of these neurological injuries is thought to be a surge of emboli released into circulation during the transition from CPB to the normal circulation following surgery. The hypothesis is that brief external compression of carotid arteries will deflect particles from entering vessels that branch from the aorta to the brain. Thus, our objective was to visualize the flow pattern in the aorta by simulating the release of the aortic cross clamp following cardiac surgery requiring CPB, while changing the waiting period before carotid compression release (10, 15 or 20 seconds).

Flow visualization experiments are performed with an aortic arch model in a mock cardiovascular system. Fluorescent particles (20?m) are used to simulate emboli that are released into circulation immediately after carotid compression. The clinical conditions are simulated using continuous flow, which is held constant at a rate of 4.0±0.5L/min for baseline conditions. The pressure in the aorta and proximal branches is 65.0±5.0mmHg, and flow through the branches (left and right carotids, and innominate artery) was set to 10% of the aortic flow. Flow patterns of particles are visualized using Particle Image Velocimetry (PIV), and analyzed with a particle analysis tool to track, count, and record particle properties from the aortic arch.

The results tabulated the particle count for each condition from background-subtracted images. For 10 seconds carotid compression, particle count was reduced by approximately 83% compared to the baseline. For 15 seconds compression, the particle count was reduced by approximately 84%. Lastly, for 20 seconds compression, particle count was reduced by approximately 81%. Recirculation of the particles is observed in the compressed carotids proximal to the aortic arch, which results in the increase of particle count as the waiting period is increased. There is no significant change in the particle count through the innominate artery (not compressed) when compared to the baseline, which implies that most of the flow is diverted into the descending aorta.

438 Poster #12
Wall shear stress variation on the ventricular side of the aortic valve leaflets during LVAD support
Zhen Wang, Bioengineering (M) Karen May-Newman, Mechanical Engineering

A life-saving device known as a LVAD is a pump that surgeons connect to the heart and aorta of heart failure patients, and boosts the blood flow to the tissues of the body. When the LVAD is pumping, the pressure in the heart is lowered, which affects the biomechanics of the aortic valve (AV), producing a decrease in opening area and duration as well as a decrease in flow through the aortic valve. These alterations may result in changes in the shear across the AV leaflets, which is an important signal for maintaining valve function. It is not known how the changes in biomechanics produced by the LVAD affect shear stress on the ventricular side of the AV leaflets. Our goal is to assess the shear alteration trend on the aortic valve leaflets during different LVAD support conditions. Our initial hypothesis is that ventricular wall shear stress remains constant as LVAD speed increases. The approach was to develop a computational model of the AV that could be solved for different levels of LVAD support. Eight 3-D models of the AV and root were developed in Solidworks to match the experimental measurements. ANSYS CFD and ICEM CFD are applied to simulate the AV subjected to the loading conditions reported by the experiments. During eight sets of CFD simulation, the computational maximum shears stress ranges from 18 to 389 dyn/(cm)^2 decreases as the LVAD speed increases. The maximum shear rate and flow rate decrease at a faster rate than that of the AV opening area. In conclusion, the maximum ventricular shear stress of the aortic valve decreases during LVAD support.
439  Poster #13

Modeling of Thrombus Formation in the LVAD Assisted Left Ventricle
Brian Herold, Mechanical Engineering (M)
Karen May-Newman, Mechanical Engineering

Left ventricular assist devices (LVAD) can be used in some cases to treat heart failure in the absence of an available heart transplant. However, there are a series of adverse events associated with these devices, one of which is the risk of clotting, or thrombosis. This study aims to model thrombosis in the left ventricle using data obtained during a previous study via particle image velocimetry (PIV) of a mock cardiac loop. Our previous study, based on clinical data, showed that a small simulated clot, or thrombus, near the left ventricular outflow tract disrupted the normal fluid flow in the ventricle and created a region of stasis distal to the thrombus. This disruption increased both with higher LVAD support and larger thrombus. The goal of the current study is to refine the time-varying velocity field data and process it using a Lagrangian Coherent Structure (LCS) approach via calculating finite-time Lyapunov exponent (FTLE) fields. These calculations are implemented in a combination of Python, C, and Matlab. LCS are structures within a fluid that have little to no fluid transport across them and maximize shear force in the region. These LCS can give insight into areas of maximum shear force and residence time of blood in the left ventricle, both of which are related to platelet activation and clotting. Preliminary results suggest a large LCS proximal to the clot, which would suggest that platelets are activated along this LCS. This LCS further suggests that distal to the thrombus is an area of high residence time. If these activated platelets were to get trapped on the other side of the LCS, they would be in a region of stasis, promoting platelet aggregation and thrombus growth. These results suggest a mechanism by which the thrombus in the clinical data inspiring this study may have grown.

440  Poster #14

Evaluation of Intra-Ventricular Flow Field in the LVAD-Assisted Heart: Summary and Future Works
Vi Vu, Mechanical and Aerospace (D)
Karen May-Newman, Mechanical Engineering

Congestive heart failure (HF) is the condition when the heart cannot sufficiently pump enough blood to the entire body. This condition affects approximately 5.7 million Americans, and 0.87 million new cases are diagnosed each year [Circulation, 2015]. The only cure of HF is a heart transplant of which there are only 3000 available worldwide annually (D. Bravata, 2012). Left ventricular assist devices (LVAD) are an alternative treatment. It is a mechanical pump that is surgically attached to the left ventricle (LV) and aorta; and helps reducing the heart’s workload.

The altered intra-ventricular blood flow pattern causing by LVAD implant results in an area of stasis near the left ventricular outflow tract (LVOT). In the presence of medical devices, flow stasis has been linked with thrombus formation. Our 2013 ASAIO Journal clinical study case reported a recurring thrombus along the LVOT following LVAD implant, which likely formed due to the disturbed flow pattern and lack of pulsatility (K May-Newman 2013). In 2014 the 2D real time velocity field and vortical flow features in LVAD patient was first measured from echocardiographic (Echo) images, which provided a better tool in early detection of blood flow abnormalities in comparison to traditional 1D flow echo. Our 2015 Journal of Biomechanics article proposed blood residence time as additional subclinical markers in assessing intra-ventricular thrombosis risk; the data were analyzed in healthy, dilated cardiomyopathy, and LVAD cases (L Rossini 2015).

The SDSU cardiac simulator has been used to study intra-ventricular flow patterns under different conditions and was validated to reproduce similar vortex patterns as observed in patients (J Wong 2014). The simulator will be used to study the formation and develop of LV thrombus and evolved to enable the validation of residence time. Moreover, echo data from new LVAD patients will continue to be analyzed for intra-ventricular vortical flows and residence time parameters. Finally, the effect of change in blood flow shear rate on thrombus formation/size will be evaluated using computational model and the cardiac simulator.

441  Poster #15

LVAD-altered aortic valve biomechanics: Its implications on tissue remodeling and the progression of Aortic Insufficiency (AI)
Madiha Jamal, Bioengineering
Karen May-Newman, Mechanical Engineering

Although Left Ventricle Assist Device (LVAD) support has enhanced the quality of life for many heart failure patients, its prolonged in vivo implantation causes change in hemodynamics and biomechanics of the aortic heart valve eventually leading to development of aortic insufficiency (AI). The LVAD decreases pressure in the left ventricle, leading to high transvalvular pressure and reduced aortic valve opening. Our hypothesis is that the increased pressure leads to increased mechanical stretch in the aortic valve leaflets, inducing a cascade of responses that ultimately result in local tissue fibrosis and AI. The goal of this study is to investigate the mechanism behind this hypothesis using the methods of tissue engineering.
A bioreactor has been built that imparts cyclic stretch and flow to small 3-D constructs of living cells cultured in a silicone membrane. The approach is to use this device for *in vitro* tissue culture of vascular interstitial cells (VICs) embedded in a collagen gel, which will be subjected to normal and altered stretch and shear representative of the *in vivo* valve biomechanics.

The amount of stretch was measured through a digital camcorder which recorded the movement of the PDMS membrane and the resulting images (30 frames/second) were analyzed using ImageJ. The bioreactor was further revised to produce a high laminar flow across the surface of the membrane, enabling the application of controlled levels of shear stress validated by using particle image velocimetry (PIV) which was conducted at an optimum image acquisition delay of 6000µs. Mean longitudinal strain of 10.8% (SD = ±3.6%) increase was recorded with mean increase in perpendicular strain being 0.088% (SD = ±3%). Measured average shear stress imparted at flow rate 100ml/min was 2.735 dynes/cm² (SD = ±2.25 dynes/cm²) with 6.21 dynes/cm² (SD = ±3.35 dynes/cm²) at 200ml/min.

These initial studies confirm that the design of the bioreactor is well suited to study aortic valve response to the biomechanical forces at a cellular level which will aid in identifying a possible mechanism and perhaps a therapeutic target for LVAD-induced AI. Studies of cells in the membrane are currently underway.

**442  Poster #16**

*The Effect of Reverse Remodeling on Intraventricular Flow in the LVAD-Assisted Heart Studied in a Mock Circulatory Loop*

Juyeun Moon, Bioengineering (M)
Karen May-Newman, Mechanical Engineering

Advanced heart failure patients may receive a Left Ventricular Assist Device (LVAD) to improve blood flow throughout their body. LVAD is a surgically implanted mechanical pump that connects the left ventricle (LV) to the aorta. After a LVAD is implanted, the heart often undergoes volume reduction and exhibits signs of restoration of normal cardiac geometry and function. Clinical studies show a reduction in LV vortex circulation and kinetic energy (KE) after LVAD implantation, which we hypothesize is due to LV volume (LVV) reduction. The goal of this study is to measure the LV flow and vortex dynamics in LV models representing the volume reduction in the LVAD-assisted heart using Particle Image Velocimetry (PIV). PIV is an engineering method in which small fluorescent particles are added to the flow and visualized using a synchronized laser and camera system. The particle movement is used to measure the velocity field within a transparent model.

Two silicone LV models were created with volumes of 180 and 100ml, and studied separately in the SDSU cardiac simulator. The LV was connected to a Thoratec Heartmate II LVAD and the 2D velocity field in the LV mid-plane was measured for Pre-LVAD conditions (baseline) and several levels of LVAD support. This field was further analyzed using MATLAB to calculate circulation, KE, position, and size of the large clockwise (CW) and smaller counter-clockwise (CCW) vortices that form in the LV during the cardiac cycle. Pulsatility index (PI) was calculated as the range divided by the mean of aortic flow (bulk) and velocity (local).

The baseline hemodynamics for both models were a cardiac output of 3.82±0.09L/min, which resulted in ejection fractions of 29 and 54%, and PI of 5.8 and 6.7, respectively, for LVV of 180 and 100ml. CW vortex circulation decreased by 34% with LVV reduction, while CCW vortex circulation increased in magnitude by 60%. CW KE did not change significantly, but CCW KE increased by 98% from 4.0 to 7.9(m/s)². The Pre-LVAD conditions establish the change in baseline levels with LVV, and will serve as the foundation for understanding the effect of LVAD support.

**Session B-12**

**Poster: Molecular Biology**

**Friday, March 4, 2016, 10:45 am – 12:15 pm**

**Location: Montezuma Hall**

**443  Poster #17**

*Duration of heat-shock protein activation in Boechera depauperata and Arabidopsis thaliana*

Tyara Vazquez, Biology/Zoology (U)
Elizabeth Waters, Biology

All organisms respond to heat-stress in a similar manner. Because plants are sessile and cannot move away from heat, their ability to mitigate heat damage is very important, particularly so as our climate warms. Heat shock proteins are chaperone proteins that are expressed during heat-stress. However, plants have more and more diverse small heat-shock proteins than other organisms. When subject to heat-stress then allowed to recover, these heat-shock proteins are activated and retained and offer protection against further heat-stress. The objective of my experiment is to test how long heat-shock proteins are activated for in *Boechera depauperata* and *Arabidopsis thaliana*. 7–10 day old seedlings were grown on 6% agar plates and subjected to a one-hour pre-treatment of 38°C then allowed to recover in...
a 22°C growth chamber for varying amounts of time such as 0 hours, 1 hour, 24 hours, and 48 hours. I tested the seedling’s responses immediately after three hours of heat-stress at varying temperatures of 41°C, 43°C, and 45°C, and after a five-day recovery period. I tested each seedling’s photosynthetic activity with a JUNIOR-Pam chlorophyll fluorometer. Electrolyte ion leakage was measured by use of the Orion 3 Star Conductivity Meter and ion leakage was recorded once every hour for four hours. Organismal responses to heat-stress were also recorded that measures chlorosis of each seedling after five days of recovery. I am still in the data collection phase, but I expect to see Boechera depauperata with low organismal responses, higher chlorophyll fluorescence, and low ion leakage at each temperature and at each recovery period compared to Arabidopsis thaliana. I also expect the 48-hour recovery period to yield similar results as the 0-hour recovery period in both plant species.

**444  Poster #18**

*Conserved Structure and Diverse Chemistry in the Biosynthesis of 7-Deazaguanosines*

Xianghan Mei, Pharmacy (M)

Manal Swairjo, Chemistry

The tunneling-fold (T-fold) superfamily has emerged as a remarkably versatile protein scaffold for the evolution of diverse catalytic activities, with myriad chemistry reported for T-fold proteins. This is especially evident in the pathways to the 7-deazaguanosine nucleosides exemplified by the modified tRNA nucleosides queuosine and archaeosine. Three members of the T-fold superfamily have been confirmed in these pathways, and together they exhibit chemistries ranging from hydrolysis to isomerization, and cyclohydrolase to oxidoreductase activity. These include the GTP cyclohydrolase types IA and IB enzymes and the nitrile oxidoreductase QueF. We recently reported the T-fold crystal structure of QueF, which catalyzes the NADPH-dependent transformation of 7- cyano-7-deazaguanine (preQ0) to 7-aminomethyl-7-deazaguanine (preQ1), a late step in the queuosine biosynthetic pathway. Here we report the crystal structure of a forth enzyme in the 7-deazaguanosine biosynthesis system, the recently discovered amidotransferase QueF-L (QueF-Like) responsible for the formation of the formamidine group of archaeosine in a subset of the Crenarchaeota. Both QueF and QueF-L utilize preQ0 as a substrate but catalyze different reactions; QueF catalyzes the reduction of the nitrile of preQ0 to a primary amine, while QueF-L catalyzes the conversion of the nitrile to a formamidino group. The QueF-L structure reveals a symmetric T-fold homodecamer, of two head-to-head facing pentameric subunits, harboring 10 active sites at the intermonomer interfaces. The structure, determined in the presence of preQ0, reveals a covalent thioimide linkage of the enzyme-bound substrate with a conserved active site cysteine, similar to the thioimide intermediate previously observed for QueF. Structural comparison of the two T-fold enzymes reveals a common substrate binding pocket but absence of the QueF motif responsible for NADPH binding in QueF. These results shed light on the mechanism of thioimide formation and subsequent amidotransfer by QueF-L, and highlight the evolution of diverse chemistry in a common fold.

**445  Poster #19**

*Cytotoxic Effects of Novel Small Molecules on PC3 Prostate Cancer Cells*

Parima Udompholkul, Molecular Biology (M)

Anca Segall, Biology

Prostate cancer (PCa) is the most common cancer among men and is the second leading cause of cancer-related deaths in males in the United States and Europe. PCa is more common in African-American than Caucasian-American men, potentially because African-American men have a higher expression of androgen receptors. Early treatments include deprivation of androgen and removal of prostate tissues. However, these treatments may be rendered ineffective as the disease progresses to become androgen-independent (the castrate refractory stage) and as the tumor metastasizes. Finding additional and more effective treatments for castrate refractory PCa is highly desirable. Our lab has previously identified peptides that stabilize Holliday junctions (HJs) and branched DNA intermediates formed during DNA recombination reactions by inhibiting their resolution. HJs are intermediates in homologous recombination repair (HRR) pathways. Cancer cells depend more on HRR than normal cells because they have more active metabolism resulting in more reactive oxygen that damages DNA, as well as uncontrolled replication and proliferation. We identified dodecamer peptides that bind to branched and HJ DNAs, and non-peptide small molecule surrogates from over 20 different chemical scaffolds. Two types of scaffolds yielded small molecules (SM3, SM10, SMP3 and SMP10) that shared some properties with the peptides, including interactions with HJs. Results of cell viability and cytotoxicity assays have shown that SMs and SMPs cause cell death in PC3 cells, and that one of the molecules reduces total DNA synthesis, but not total RNA or protein synthesis. Small molecule-induced cell death is lethal and independent of p53-induced apoptosis. In addition, small molecules induce double-stranded DNA breaks and activate the DNA damage sensors γH2AX and p53-binding protein 1 (53BP1). As a result, the downstream signaling checkpoint proteins, Chk1 and Chk2 are activated. We thus have identified a new class of molecules with chemotherapeutic potential, which could be used either alone or in conjunction with other chemotherapeutic agents with orthogonal modes of action as new options in PCa treatment and treatment of other cancers.
**Poster #20**

**Investigation of LEF-1 Flexibility vs DNA Binding Activity**

Ariana Pientka, Chemistry (M)  
John Love, Chemistry

The protein LEF-1 (Lymphoid Enhancer-binding Factor 1) is a mammalian transcription factor with high similarity to the HMG (High Mobility Group) B protein domain. While all proteins structurally similar to the HMG B domain bend DNA on binding, LEF-1 specifically bends DNA 100 degrees in a mutually induced fit.

The mechanism by which LEF-1 and DNA bend into this arrangement is not well understood; it is hypothesized that LEF-1’s flexibility when free in solution is necessary for its activity. Knowing that HMG members and analogs such as LEF-1 play a role in everything from cell differentiation to cell death, we are using protein design techniques to alter LEF-1’s flexibility and observe the shift in binding affinity to understand how it achieves this mutually induced fit.

There are two main priorities at this current point in the project. The first is to observe the binding affinity via microscale thermophoresis (MST). This is an area of ongoing effort, as all attempts so far to obtain data for this system with MST have been met with frustration. Correlation with peers has confirmed that with rare exception, the only system that gives results consistent with what should be expected for the technique is the control kit supplied by the manufacturer of the thermophoresis equipment. Most time in this regard has been spent troubleshooting the parameters and technique.

The second priority involves a previously designed suite of variants of LEF-1. LEF-1’s configuration means there are few stabilizing interactions that do not alter the binding site; mutations were therefore restricted to its well-conserved hydrophobic cores. These variants demonstrated subtle differences in binding affinity to DNA when run through EMSA. Since the lysine-rich C-terminal tail of LEF-1 is a major factor in the stability of the bound complex, shortening this tail will reduce the binding affinity. By truncating the tail of wild type LEF-1 and the suite of variants, any difference in binding affinities should become more pronounced, allowing identification of stabilized variants relative to wild type. If MST continues to prove problematic for observing the LEF-1/DNA system, the binding affinities will be measured by EMSA.

**Poster #21**

**Monitoring Metallo-proteinase Cleavage Activity at the Cell Surface**

Andre Dharmawan, Cell and Molecular Biology (M)  
Roland Wolkowicz, Biology

Proteolysis is an essential biological process utilized, among many others, for protein activation, degradation of aggregates, and regulation of signaling cascades. While a large number of proteolytic events occur in the intracellular secretory pathway of the trans-Golgi network, extracellular proteolysis at the cell surface and extracellular matrix (ECM) play significant roles in the progression of diseases, as exemplified by the role of Matrix Metalloproteinase (MMP)-14 in cancer and metastasis. MMP-14 is known to be highly expressed in cancer tissue as cells require constant remodeling of ECM for fast repulsion and migration. Currently, there is a need to find novel MMP-14 inhibitors (MMPIs) in an effort to block cellular transformation and metastasis; however, there are limited cell-based assays that monitor cleavage event at the cell surface. Therefore, we are proposing to develop and optimize a cell-based assay to monitor cleavage events at the cell surface using an optimized substrate of MMP-14 as a proof-of-principle.

The assay is based on a two-tag system flanking an optimized substrate of MMP-14 that serves as the primary detection element that can distinguish cleavage and non-cleavage events. A fluorescent protein is introduced adjacent of these two tags as a visual marker for cell surface localization by fluorescence microscopy. Lastly, the entire scaffold protein will be targeted and anchored on the cell surface by the addition of the C-terminal transmembrane domain of mouse Lyt-2 cell surface protein. The utility of the assay for monitoring cleavage at the cell surface will be demonstrated with the overexpression of MMP-14 in the presence of the substrate scaffold protein in clonal populations. Experiments to corroborate that cleavage occurs at the cell surface or ECM and not within the classical secretory pathway will be undertaken as well. This novel cell-based platform will represent a powerful tool for the search of inhibitors/competitors of MMP-14 substrate recognition and/or cleavage. MMP-14 and/or its substrates should become a novel target for drug discovery against cell metastasis.
Session B-13
Poster: Synthetic Chemistry
Friday, March 4, 2016, 10:45 am – 12:15 pm
Location: Montezuma Hall

448  Poster #22
Synthesis of Potassium Alkenyl Trifluoroborate Salts via Hydroboration of Terminal Alkynes Using Dicyclohexylborane and Two Groups Reductive Elimination with Quinone
Khawlah Alanqari, Chemistry (M)
Thomas Cole, Chemistry

Potassium alkenyl trifluoroborate derivatives are valuable synthetic intermediates. They have been successfully used in synthesizing important motifs and fragments in drug discovery programs using the metal catalyzed Suzuki-Miyaura and Chan-Lam cross-coupling reactions. Also, they have showed a successful cross-coupling with imines to give $\alpha$-chiral branched amines. Our aim is to synthesize functionalized potassium alkenyl trifluoroborate derivatives. The most direct way is by hydroboration of functionalized terminal alkynes. However, the existing hydroboration reagents reduce a significant amount of the functional groups. Recently, we discovered a remarkable property of dicyclohexylborane. This reagent rapidly hydroborates functionalized terminal alkynes without reduction of the functional groups. The cyclohexyl groups are selectively removed by reductive alkylation with two equivalents of $p$-benzoquinone and the resultant boronic esters are converted into functionalized potassium trifluoroborate salt in very good to excellent yields. In this study, we will report our efforts in preparing a functionalized potassium alkenyl trifluoroborate salts via hydroboration of terminal alkynes; resulting in a $trans$- alkenyl boron derivatives. These salts have a greater stability to air and water over the corresponding boronic acids, and generally have a high reactivity in many processes; which can be used in cross-coupling reactions to form potent and valuable synthetic intermediates.

449  Poster 23#
A Novel Synthesis of Silver Nanoparticles Absorbing in the Infrared
Andrew Nuhaily, Chemistry (U)
David Pullman, Chemistry

Silver nanoparticles have a wide variety of applications due to their unique optical properties that allow them to strongly absorb and scatter visible light. One potential application is in improving the absorption capacity of solar cells. The Pullman group has successfully produced silver nanoparticles 5–10nm in diameter (spherical) that absorb at a peak wavelength of 400nm. This study aims at developing a practical synthetic method of producing silver nanoparticles 50–100nm in size able to absorb light from the infrared region. Such nanostructures could greatly increase the efficiency of solar cells as wavelengths greater than 700nm are not readily absorbed by conventional silicon solar cells. Recent experimental data shows that using sodium ascorbate as a ligand in conjunction with sodium citrate can form stabilized nanoparticles that are capable of absorbing in the near-IR. The reaction is monitored by measuring the UV-Visible spectrum as a function of time. Citrate-capped silver nanoparticles have a distinctive surface plasmon peak at 400nm while these larger nanostructures resonate at a tunable peak wavelength ranging from 700–950nm. The ultimate goal of this project is to develop a fast, inexpensive, and effective method of producing a monodispersed solution of infrared-absorbing silver nanoparticles that is stable in light and does not polymerize due to the effects of light energy.

450  Poster #24
Progressive New Methods Towards the Total Synthesis of Azaspirene and its Analogs: Promising New Cancer Treatments
Sean Najjar, Chemistry (U)
Michael Bergdahl, Chemistry

Azaspirene, an angiogenesis inhibitor, has the remarkable ability to starve tumor cells without damaging normal cell growth. Inhibition of the tumor cells is accomplished by disrupting the tumor cells’ ability to grow new blood vessels that supply the tumor with nutrients. This class of anti-cancer compounds is anticipated to be a milder form of chemotherapy. Azaspirene was isolated from the soil fungus Neosartorya sp. and belongs to the Pseurotin family of compounds whose members also show promise as anti-fungal and anti-bacterial agents. The supply of Azaspirene that has been harvested from natural sources is too small to sustain further research; therefore, it is critical that an economical and efficient synthesis be established. This research is innovative in the following ways: 1) it creates a novel, asymmetric synthesis to the core structure of azaspirene; 2) the approach lends itself toward a more economical and efficient route to azaspirene; 3) the route utilizes our lab’s proprietary copper chemistry; and 4) allows for the potential to supply an ample amount of compound to further explore the cancer treatment capacity of azaspirene and its related compounds. Results: Our approach starts with cheap and easily-accessible L-phenyl alanine used as a chiral source to create the backbone of azaspirene. We are two-thirds of the way through the synthetic approach with optimization of most steps to produce yields of 75 – 99%. We expect to have azaspirene synthesized in the near future, and will then proceed to biological testing of azaspirene.
and its derivatives. Conclusions: The reported synthetic strategy used will complete the novel total synthesis of azaspirene and its pseudoisin analogs, characterize the biological activity of azaspirene through active site binding and crystal structure experiments, and evaluate the potential of azaspirene to serve as an anti-inflammatory, anti-angiogenic, and anti-breast tumor agent with our collaborators at UCSD and Moores Cancer Center.

Poster #25

A Method to Assemble Larger Supramolecular Structures Through Radical Pi Stacking Interactions Using Viologens

Joquel Vasquez, Biochemistry (U)
Diane Smith, Chemistry

This project is an investigation on self-assembled nanostructures: horizontally linked electroactive moieties formed from radical pi dimers. Our aim is to confirm that supramolecular assemblies can be facilitated by linking viologens. Viologens are so called because in high concentration, with a reducing agent, they form deep purple radical dimers in water. The current study is of xylene-linked viologens and uses methyl viologen as a test system. Methyl viologen (MV) radical cations are well known to dimerize. They form a pi dimer through a weak, non-conventional covalent bond resulting in spin pairing. We use UV-Vis spectroscopy in order to measure the $K_{dimerization}$ since the viologen dimer and monomer are known to have different absorption spectra. The viologen radicals are highly oxygen sensitive, which greatly complicates the experimental setup since oxygen must be excluded. In previous experiments, we used bulk electrolysis in addition to a UV-vis flow cell in order to obtain the spectra. Currently chemical reduction is performed with the addition of sodium dithionate to our solution, and a fiber optic dip probe is used to obtain the spectra in situ. We then compare the data at low concentrations and high concentrations noting whether the methyl viologen radical exists primarily as a monomer form or dimerized form. It is possible to see clear differences between the spectra of methyl viologen and the xyllyl-linked viologen, indicating that at concentrations where methyl viologen radical exists primarily as a monomer, the linked viologen radicals are completely dimerized. Since the xyllyl bridge prevents intramolecular dimerization, intermolecular supramolecular aggregates must be forming. Future work will include improving our methodology to achieve complete reduction and further concentration studies of both methyl viologen and the xyllyl-linked viologen to measure the $K_{dimerization}$.

Poster #26

Synthesis and Application of Novel Phosphonic Acids via Trifluoroborates

Lauren Daley, Biology (U)
Thomas Cole, Chemistry

The majority of organoborane chemistry is limited to planar, sp² couplings since the catalysts used in those reactions are more reactive and predictable. As the demand for complex functionalized molecules increases, the search for a more versatile synthesis pathway of generating sp³ atom molecules becomes imperative. Here, we present the extension of the two-group reductive alkylation method that has already been applied to a variety of functionalized starting alkenes. This pathway does not require protecting functional groups, is faster and simpler that other synthesis pathways, and uses more readily available starting reagents. We hypothesize that phosphonates can join the many other compounds that have been synthesized by this newly developed method. Specifically, the phosphonate trifluoroborate can be used as a reagent in Chan-Lam or Suzuki coupling reactions giving desired bond formation. Diethyl allyl phosphonate was used for the original reaction with dicyclohexylborane, and after the overnight reaction with p-benzoquinone, potassium bisfluoride was used in water to form the air-stable trifluoroborate salt. Upon purification and isolation of the desired product, an ionic liquid was found, requiring a new isolation procedure. We anticipate these trifluoroborate phosphonates can be used in well known Suzuki-Miyaura and Chan-Lam cross-coupling reactions. Successful demonstration of these reactions would permit a simple route to phosphonic derivatives, known to be biologically active and useful as synthetic reagents. Ultimately, we present our developed chemistry as an efficient method to achieve products that would otherwise be difficult to synthesize.
Session B-14
Poster: Caregiver
Friday, March 4, 2016, 10:45 am – 12:15 pm
Location: Montezuma Hall

453 Poster #27
Not The Stereotypical Black Teen Mother: Factors that have helped contributed to their success
Myra Hollis, Psychology (U)
Antwanisha Alameen-Shavers, Africana Studies

Teen mothers have many odds against them once they become pregnant and also after they have their first child, particularly African American teen mothers due to the lack of resources and community support. Teen pregnancy and success has been studied across different culture groups. However, research assessing the relationship between black teen mothers and success is scarce. This study will investigate the factors that contributed to Black women’s success that had children during their teenage years. Success is defined as obtaining a degree or landing a well paid career. In order to determine the extent to which being a young black mother is related to completing higher education/being successful, a qualitative interview will be conducted with 6–8 Black women that meet the criteria. Within this, we will find out the factors that helped these women to reach their success.

454 Poster #28
Predictors of Perceived Barriers to Participation and Effectiveness in Child Mental Health Treatment
Becky Kremer, Psychology (U)
Rachel Haine-Schlagel, Child and Family Development

Objective: Untreated child mental illness is an extremely detrimental and overlooked issue in the U.S. today. According to the NIH, approximately half of all chronic mental illnesses occur before age 14. As their legal guardians and gatekeepers, it is parents’ responsibility to ensure that their children receive necessary treatment. This study aims to examine characteristics and attitudes of parents that affect a parent’s perception of barriers to attending treatment and its overall effectiveness. The knowledge gained from this study can help guide efforts to promote engagement in services. Methods: 18 parents whose child was receiving mental health treatment were included. Parents were 94.4% female. A total of 72.2% were of racial/ethnic minority background, 45.6% had more than a high school education, and their children were 77.8% male, ages 5–12. Participants were in a pilot intervention study and were randomized to either receive a parent-participation toolkit as part of standard care or receive standard care alone (n=10 toolkit; n=8 standard care). Early in treatment, parents completed measures of sociodemographic information, depression, perceived self-efficacy in patient-provider interactions, motivation, and parent-therapist alliance. At four-month follow-up, parents reported on perceived barriers to participation and treatment effectiveness. Results: Controlling for condition, a significant predictor of the treatment expectations subscale of the barriers to treatment participation measure was parent-therapist alliance (B = -.82, p < .05, F-squared = .71), while two subscales of the parent motivation measure, readiness to change and ability to change were marginally significant. For the external demands subscale of the barriers measure, parent’s readiness to change was a marginally significant predictor. Significant predictors of perceived treatment effectiveness at follow-up were parent-therapist alliance (B = .29, p < .05, F-squared = .56), parent’s readiness to change (B = .21, p < .05, F-squared = .43) and ability to change (B = .47, p < .05, F-squared = .53). Conclusions: Parent’s readiness and ability to change, and parent-provider relationship early in treatment are associated with an increase in perceived treatment effectiveness and a decrease in perceived barriers to treatment participation. Parent attitudes certainly can have an impact on participation in child mental health treatment and how well it works. These findings can inform training for providers focused on motivating and establishing rapport with parents early in treatment.

455 Poster #29
The Psychometric Properties of the Arnett Caregiver Interaction Scale (CIS) to Measure the Quality of Early-Childhood Practitioner Caregiver Performance
Kristi Allen, Public Health (M)
Shulamit Ritblatt, Child and Family Development

BACKGROUND: The EC-SEBRIS Certificate Program at SDSU trains early childhood practitioner (ECP) students to develop appropriate knowledge and skills for recognizing and responding to behavioral challenges among children 0 to 5 years old. The quality of ECP students’ caregiving performance was measured in four multi-dimensional domains of caregiver-child interaction theory using Arnett’s CIS (1989). RESEARCH QUESTIONS & HYPOTHESES: The functionality of the 26-item CIS, measured on a 4-point Likert scale, was examined for ability to capture aspects of ECP student caregiver-child interaction theory. Aim 1: Is the CIS measure a reliable and valid measure of theory for the sample? Construct validity occurs when items are retained in accordance with Arnett’s constructs. Hypothesis 1: The CIS is internally consistent for the sample, but does not validly measure Arnett...
theory’s among the sample of students who are not children’s parents. **Aim 2:** Do alternative interpretations of CIS measurement theory exist for this sample? **Hypothesis 2:** The CIS measures alternative constructs to those proposed by Arnett for the sample. **METHODS:** The CIS psychometric properties were examined using confirmatory (CFA) and exploratory factor analyses (EFA) techniques among N = 92 EC-SEBRIS graduate students pursuing early childhood mental health certifications at SDSU from 2011 to 2015. Trained observers employed the CIS to assess student performance while interacting with children at local child development fieldwork internship sites. Higher scores indicate more positive caregiving. **PRELIMINARY RESULTS:** Inter-item correlations are above \( r = 0.3 \), the Kaiser-Meyer-Olkin measure of sampling adequacy is 0.875, and Bartlett’s test of sphericity was significant, \( \chi^2 (325) = 2632.84, p < 0.005 \). CFA and EFA results are based on five criteria for item retention, three factor extraction methods (ML, PCA, and PAF) and three rotations techniques (direct oblimin, promax and varimax). Items that converge into fit models may revel alternative components of theory that should be considered in future impact assessment scale development. **CONCLUSION:** A novel impact assessment scale should be developed and tested that reliably and validity measures effects of the EC-SEBRIS program on ECP caregiving performance that is specific to students interacting with children in applied learning contexts.

**456 Poster #30**

**Differences in Parenting Strategies of Kin vs. Non-Kin Foster Parents**

Cleo Mae Burce, Psychology (M)
Joseph Price, Psychology

There is an increased preference for kin-care placement for foster youths; however, there have been contradicting research findings in the type of parenting strategies employed by kin foster parents and non-kin foster parents. Some researchers have found that kin foster parents reported less warmth and respect and are more likely to report use of physical discipline than non-kin foster parents (Harden et al., 2004; Litrownik et al., 2003). In contrast, other researchers have found kin foster parents reported high levels of parental warmth, supportiveness and attentiveness (Richardson & Gleeson, 2012). The purpose of this study was to examine the parenting practices of kin and non-kin foster parents to better understand the differences in their parenting strategies. Participants included 334 foster parents (41% Hispanic, 36.4% Caucasian, 16.6% African American, 6% multi/other) who were part of Keeping Foster Parents Trained and Supported (KEEP), a foster parent training intervention. Frequency of parenting strategies was assessed during a baseline phone interview with caregivers using a measure of parenting strategies used in prior studies of KEEP, rated on a scale of 1 (Don’t use this strategy) to 7 (3 or more times/day).

Parenting variables were related to each other at low to moderate levels. Potential covariates (e.g., child age, number of children in the home) were also examined in relation to parenting variables. Using the findings from these analyses, a series of analyses of variance (ANCOVAs) were performed to examine the differences between kin and non-kin foster parents on their parenting strategies. Results indicated that non-kin foster parents were more likely than kin foster parents to report higher levels of praise \( F(1, 314) = 10.38, p < .001 \), rewards \( F(1, 316) = 31.14, p < .001 \), reasoning/discussion \( F(1, 314) = 5.98, p = .02 \) and discipline \( F(1, 316) = 3.47, p = .06 \) to encourage positive behavior and deal with challenging behaviors. However, kin foster parents were more likely than non-kin foster parents to report higher levels of physical discipline \( F(1, 296) = 3.99, p = .05 \). In general, non-kin foster parents were more likely to use reward-based parenting strategies than kin foster parents. These findings have the potential to inform our understanding of parenting styles of kin and non-kin foster parents.

**457 Poster #31**

**Perceptions of Parent School Collaboration Within Single Parent Households**

Jason Josafat, Educational Leadership (D)
Ian Pumppin, Educational Leadership

Little is known regarding the involvement levels of single parents in their child’s education or what schools can do to support the collaborative involvement with single parents. This is important, because parent involvement is crucial for student success, and schools play an important part in garnering this role towards parent involvement; single parents face unique challenges in becoming involved in their child’s education. Based on Joyce Epstein’s framework of six different types of parent involvement, single parents of high school children in a Southern California high school district completed surveys (N = 32) and interviews (N = 10) regarding parenting, communicating, volunteering, learning at home, decision-making, and collaborating with the community. Quantitative data were analyzed using repeated measures ANOVA and triangulated with the themes from the interview data. The results of this study identified emergent themes that were key to establishing single parent involvement within schools. These themes included: appropriate (a) time and scheduling, having a voice in (b) school governance, some support regarding (c) personal and social well-being within the school, and understanding the use of (d) technology.

The findings represented the importance towards fostering greater levels of parent involvement and parent-school collaboration. Furthermore, the overall findings currently highlight the need for collaboration between schools and single parents towards optimizing educational outcomes for children of single parents.
**Session B-15**

**Poster: Children's Health**

Friday, March 4, 2016, 10:45 am – 12:15 pm

Location: Montezuma Hall

**Poster #32**

*Child and Parent Reports of Food Ordering Behaviors: Is there a difference?*

Jessica Cerda, Psychology (U)
Guadalupe Ayala, Graduate School of Public Health

Self-report is a widely used method of data collection in research. Previous literature suggests that the validity of self-reporting varies by behavior (i.e. dietary behaviors vs. substance use) and respondent-type. For example, a previous study examining the correspondence between self- and parent-reports of child weight suggested that children’s reports about their body weight were significantly less valid than parent-reports of the child’s weight. Little is known about the differences in validity between child- and parent-reporting when it comes to dietary behaviors like food ordering in restaurants. This study examined the relationship between objective and self-reported measures of ordering behaviors at sit-down restaurants to consider the validity of self- and/or parent-reports. We hypothesized that there would be a significant difference between what participants reported having ordered and what was observed at the time of order placement. We also hypothesized that adult-reports will differ from observed orders compared to those of child respondents. The current study is a secondary analysis of data obtained from the Kids’ Choice Restaurant Program, an intervention to introduce healthier menu choices for children in restaurants. Data were obtained from children and the adult with whom they were dining out at restaurants in the San Diego area. Evaluation was possible by comparing observed food orders for children to self- or parent-reports of the children’s food orders. Data collection methods included unobtrusive observations of dining parties with children at the time of order placement, followed by an interview with the parties afterwards. A chi square test will assess the relationship between reported and observed food orders. An independent sample t-test will examine whether there are differences in reporting between parents and children. Preliminary results show a total of 150 children were observed (51.3% female, 48.7% male) at 10 different restaurants between November 2014 and February 2015. Adult respondents identified as being of Hispanic/Latino descent 53% of the time. Findings from the current study could inform research regarding whether or not self-report is a method that can be appropriately used among research participants in this context.

**Poster #33**

*Children’s Consumption Behavior in Restaurants*

Veronica Varela Reyes, Marketing (U)
Iana Castro, Marketing

Introduction. Childhood obesity is a top public health concern in today’s day and age. Due to the high prevalence of childhood obesity, and families increasingly eating out at restaurants, it is important to target a child’s consumption behavior in a restaurant setting. Doing so will allow us to better understand the effects eating out at restaurants has on a child’s health. This study examined children’s consumption amount in restaurants to better understand how different factors, such as child gender, menu ordered from, who places the order (parent or child), and knowing what to order in advance, influence children’s consumption behaviors. The over-arching goal of this research was to inform the introduction of healthy children’s menus in independent restaurants. Methods. 10 independent sit-down restaurants with varied food types agreed to allow unobtrusive observations of dining parties with children. Interviews were conducted post-order and post-meal with observed dining parties. Results. Who places the order and consumption amount were found to have a significant relationship. Children ate more food when they ordered their food than when a parent placed the order. On the other hand, the relationships between child gender, menu ordered from, and knowing what to order ahead of time and consumption amount were not significant. Although no significance was found within these, through descriptive statistics it was found that our sample ordered more from the adult menu (79.7%) than from the children’s menu (20.3%). Discussion. Our findings suggest that who places the order is a key factor in determining consumption amount. Meaning, when a child orders they are more likely to eat half or more of their meal in comparison to when an adult orders. When an adult orders, a child is more likely to eat less than half of their meal. Conclusions. The results of this study provide insight into what factors may influence children’s consumption amounts and potential methods to persuade children to eat healthier. This study provides future researchers a more focused look at children’s consumption behaviors in a restaurant setting.
**460 Poster #34**  
*School and Community Level Factors Associated with Change in Student Body Mass Index*  
Douglas Dalay, Social Work and Public Health (M)  
Melody Schiaffino, Graduate School of Public Health  

The prevalence of childhood obesity rose to epidemic proportions within the last few decades, but had become stable in recent years. The precise mechanisms to account for the obesity abatement are uncertain, however. A tremendous number of studies focusing on obesity prevention revolved around behavior modification to increase physical activity and improve dietary habits, but a paucity of research had been conducted to find environmental factors associated with change in weight-related indices. The current study explored the school- and community-level factors associated with a change in body mass index (BMI)—a proxy measurement of an individual's body fat content—in a San Diego County school district. After district-wide, environmental changes were made, a five-point percentage decrease in unhealthy BMI weight categories was found between 2010 and 2014. The theoretical bases upon which the study is conceptualized is social ecological theory, which provides the theoretical framework to explain how the school and community environment affects a child’s health-promoting behavior. The primary outcomes for the study were changes in the obese and normal weight BMI categories between the 2010 and 2014, using the BMI data collected from the school district. The primary independent variables hypothesized to be associated with a change in the BMI categories were the proportion of students who qualified for free or reduced price meals. On the community level, household income was hypothesized to be associated with change in BMI categories. The unit of analysis was the individual school within the district. The final sample was N = 42. SPSS was used to analyze the data. The statistical analyses included descriptive frequencies, sensitivity analysis, Chi-squared test, t-test and linear regression. The linear regression showed that the higher proportion of free or reduced price meals was significantly (p < .05) associated with a reduction in obese category and normal weight category. This finding bolsters national recommendations to provide school meals that meet dietary guidelines to all students, particularly low-income students. The major limitation of the study is the small sample, and further research of school districts with similar school and community demographics of the current study's school district is warranted.

**461 Poster #35**  
*Foster Care as a Moderator Between Substance Abuse and Dating Violence*  
Monica Guzman, Psychology (M)  
Emilio Ulloa, Psychology  

The relationship between substance abuse and dating violence has been well studied over the past few decades, but has not been as extensively researched in the foster care population. Studies that have been conducted with this population have demonstrated an increase in negative outcomes as a result of having experienced foster care. Few studies have examined substance use or dating violence in relation to foster care experiences and the results come from small or non-representative samples. The current study evaluated the role that being in foster care can have in the relationship between substance abuse and dating violence. We predict that individuals who were in foster care, as children, would be more likely to abuse drugs and will experience higher levels of dating violence than individuals who were not in foster care. In addition, the relationship between substance abuse and dating violence will be greater for those in foster care compared to those not in the foster care system. Finally, the time spent in foster care will exacerbate the relationship between substance abuse and dating violence. The results of this study may have implications for foster care programs and may call attention to negative outcomes associated with foster care homes and their aversive consequences.

**462 Poster #36**  
*The relationship between acculturation and Chinese parents’ beliefs about young children’s emotions*  
Jue Zhang, Child and Family Development (M)  
Sarah Garrity, Child and Family Development  

The emotional development of young children has received a great deal of attention due to its fundamental role in their social development and academic achievement in the future. Many studies indicate that parental emotional socialization practices are intimately related to their children’s emotional development. While a small number of studies have reported differences among the emotion-related practices of parents from diverse cultural backgrounds, little attention has been paid to immigrant parents’ beliefs about children’s emotions and the role of acculturation status on these beliefs. Statistics indicate that immigrant population is largely increasing in the United States, especially in...
California. Besides, California has the largest Asian, and Chinese Americans are the biggest subgroup of Asian population which comprises over 4.5 million. According to the theoretical concept of cultural community, immigrant parents are likely to change their parenting practices as they are placed in a new cultural context. The purpose of this research is to explore whether there is a relationship between acculturation status and Chinese parents’ beliefs about young children’s emotions.

Session B-16  
**Poster: Evolution**  
Friday, March 4, 2016, 10:45 am – 12:15 pm  
Location: Montezuma Hall

### 463 Poster #37  
**Bam Geometry**  
Maxwell Anthenelli, Physics (U)  
Antoni Luque, Mathematics  

Background: Mucus is a protective barrier that coats many organs in humans. It is also known that certain types of organs have a fractal surface which allows them to absorb nutrients more readily, but leaves them more susceptible to microbes which could damage the tissue. The mucus coating the organs contains antimicrobial molecules and phages. Generally bacterial infections in these regions are treated with antimicrobials. Hypothesis: Phages have coevolved mucus interactions to protect the host. It seems that antimicrobial molecules alone can’t guarantee the protection of fractal surfaces, but phages do. Therefore, we hypothesized that the phage would outperform antimicrobials as a microbe concentration constraint on tissues with fractal surfaces. Methods: We created multiple predator-prey models to test the efficacy of the antimicrobial and phage on a single microbe population in a fractal environment. We would then analyze these models to determine the efficiency of antimicrobial molecules and virulent phages against bacteria. Results: Based on initial results the phage is indeed better than the antimicrobial at keeping the microbe concentration below a threshold “kill” value. More conclusions pending. Impact: Phage therapy is a rapidly expanding field. It involves taking advantage of bacteriophages to strategically control commensal and pathogenic bacteria in humans. This model is a good approximation that could help determine the parameters for bioengineers to manufacture different phages based on the fractal dimension in that environment.

### 464 Poster #38  
**Identifying isolates that use alginites as a carbon source**  
Taylor Cram, Microbiology (U)  
Elizabeth Dinsdale, Biology  

Microbes are the most abundant organism in the ocean and they are an important organisms in carbon cycling. Southern California’s food webs are driven by kelp forests that release large amounts of Dissolved Organic Carbon into the environment. Understanding interactions between kelp derived carbon and the microbial community will provide information on the processes of carbon cycling and nutrient availability in the kelp forest. Alginate is a kelp specific carbon that can be found in the cell walls of the kelp, and some bacteria produce alginate lyase, an enzyme used to break down the alginate. In this research we will determine whether a range of microbial isolates can use alginate as their carbon source. The isolates, 574 in total, were collected from both the kelp and the water from three different locations, Point Loma, La Jolla, and Catalina. These isolates will be grown on agar plates containing 0.3 % sodium alginate as the sole carbon source. We hypothesize that the isolates collected from the kelp samples in all three locations will grow better on the alginate derived carbon than those from the water column. The results of the bacterial growth will provide insight into the role the bacteria play in carbon cycling within the kelp forest.

### 465 Poster #39  
**Response of free-ranging sidewinder rattlesnakes (Crotalus cerastes) to the antisnake displays of desert kangaroo rats (Dipodomys deserti)**  
Malachi Whitford, Ecology (D)  
Rulon Clark, Biology  

Many prey species are known to perform complex, multicomponent, multimodal displays towards their predators, referred to as predator-deterrent behaviors. These predator-deterrent behaviors are thought to inform the predator that continued pursuit of the prey is futile. That said, however, few studies have illustrated how these predator-deterrent behaviors alter the predator’s behavior. Here, we examined the influence of the predator-deterrent behaviors performed by the desert kangaroo rat (Dipodomys deserti) on the strike and abandonment behaviors of the sidewinder rattlesnake (Crotalus cerastes). We video recorded natural encounters and quantified the number and type of predator-deterrent behaviors displayed by the desert kangaroo rats, as well as the timing of any strike attempts or abandonment behaviors of the sidewinder rattlesnakes. As sidewinder rattlesnakes are sit-and-wait ambush predators, there are two types of abandonment behaviors that we tested: 1) ambush coil abandonment, which occurs when the snake
uncoils and moves out of the area occupied by its body when it was coiled, and 2) hunting site abandonment, which occurs when the snake moves >5 m and adopts an ambush coil at a new hunting site. We hypothesized that the predator-deterrent behaviors would decrease the likelihood of a strike attempt, and would increase both the likelihood that the sidewinder would abandon an ambush coil and the likelihood that the sidewinder would abandon a hunting site. We found that any level of predator-deterrent signaling eliminated any possibility of a strike attempt. Additionally, we found that a particular predator behavior, sand kicking, increased the likelihood that the sidewinder rattlesnake would abandon ambush. No predator-deterrent behaviors were found to alter the likelihood that the sidewinder would abandon a hunting site. Our results provide some of the first insight into how predators differentially respond to complex, multicomponent predator-deterrent signaling.

466 Poster #40

*Heightened vigilance in desert kangaroo rats (Dipodomys deserti) strengthens evasive response behavior to rattlesnake strikes*

Grace Freymiller, Biology/Ecology (M)
Rulon Clark, Biology

Predation shapes the morphology and behavior of virtually all species, often resulting in predator-prey coevolution. In systems where predators depend on sudden, high-speed attacks, both predator and prey evolve faster responses. Rattlesnakes (*Crotalus spp.*) are one such taxon that relies on bursts of speed to strike and subdue prey, so their prey must develop correspondingly fast avoidance maneuvers in order to survive. Rattlesnakes are a major threat to kangaroo rats (*Dipodomys spp.*), which has potentially shaped their unique morphology and behavior. The characteristic large hind legs of kangaroo rats allow them to escape a rattlesnake strike via a rapid evasive jump. However, as rattlesnake strikes take less than 100 ms from start to finish, kangaroo rats have a very limited amount of time to both initiate a response and displace their bodies from the path of the strike. It is therefore likely that the ability of kangaroo rats to evade a strike is highly dependent on the ecological context surrounding the evasive maneuver, such as recent encounters with predators that heighten kangaroo rats’ vigilance levels. We simulated rattlesnake strikes to free-ranging kangaroo rats and recorded their evasive responses, then quantified variables such as reaction time and body displacement time. To understand how the evasion maneuvers are altered by previous predatory encounters, we manipulated vigilance in some kangaroo rats by allowing them to interact with a tethered rattlesnake before eliciting the evasive response (hereafter termed “high-vigilance” rats). High-vigilance kangaroo rats reacted to the simulated strike and moved out of the path of an oncoming strike faster than low-vigilance rats (not exposed to tethered snake). The enhanced performance of high-vigilance kangaroo rats could be the difference between life and death for these rodents as their reaction times and body displacement times are just fast enough to evade an oncoming strike. This study provides support for and insight into the idea that prey state can dictate the outcome of high-speed predator-prey interactions. Our findings also support previous research that suggest the enlarged hind limbs of kangaroo rats evolved for evasive maneuvers, as opposed to locomotor efficiency.

467 Poster #41

*Phylogenetic Inference of Teiid Lizards Based on Multiple Genes*

Steven Byrum, Biology (U)
Tod Reeder, Biology

Lizards of the family Teiidae (tegu and whiptails) are a diverse group of squamate reptiles, encompassing over 230 species. Their distribution covers a wide range of habitats from the southern half of the United States to upper Argentina, and the Caribbean West Indies. The family is known for containing many unisexual species, and the heliothermic and active foraging behavior makes teiids relatively easy to locate and have thus been widely studied in biological research. Because of the great interest in this group of lizards, evolutionary biologists have attempted to gain a better understanding of phylogenetic relationships within the family; however, many phylogenetic studies have been hindered by lack of sufficient data and/or limited taxon sampling. A recent study involved a large scale phylogenetic analysis by Pyron et al. (2013) that used DNA sequence data from nine genes for >4000 squamate species, with this study including 61 species of teiids. Though the scale of the study was impressive, some of the inferred phylogenetic relationships are not consistent with previous hypotheses and are likely incorrect because of the inclusion of ambiguously aligned mitochondrial 12S and 16S gene regions. The purpose of my study is to use the teiid portion of the Pyron et al. dataset to re-evaluate the phylogenetic relationships among teiids lizards after more rigorously aligning the 12S and 16S genes, as well add additional species to the dataset (i.e., new data from our lab and more recently deposited data from GenBank). My new dataset includes 78 teiid species (~28% increase), representing the most extensive taxon sampling of any teiid phylogenetic study to date. Phylogenetic analysis of this expanded dataset using maximum likelihood methods confirms many previously proposed relationships such as the monophyly of Tupinambinae and Teiidae, the sister relationship of Kentropix and Cnemidophorus, and the monophyly of all teiinae except “Ameiva”. The expanded dataset supports the monophyly of the West Indian Ameiva, counter to the hypothesis of Pyron et al., which suggested that Dicrodon, Aurivela, and Contomastix were nested within the clade.
ABSTRACTS

468  Poster #42

Morphological studies of short-range endemic Japanese and Californian harvestmen (Opiliones: Laniatores: Travunioidea)
Stephanie Castillo, Biology (U)
Marshal Hedin, Biology

Opiliones (harvestmen) are the third largest order of arachnids after the Acari (mites and ticks) and Araneae (spiders). Phylogenetic data support Travunioidea as an early-diverging clade within Laniatores, the most diverse suborder of harvestmen. Travunioidea is comprised of short-range endemic taxa distributed in East Asia, North America, and southern Europe, and is currently classified into three families: Travuniidae, Paranonychidae, and Nippononychidae. The complex tarsal claw structure on legs III and IV have traditionally been used to distinguish families and genera in Travunioidea. However, the current Travunioidea classification is problematic at higher levels because tarsal claw morphology was found to be homoplastic. Here we present the first study using scanning electron microscopy to assess homology and variation of the tarsal claw and male genitalia within the family Nippononychidae—a hypothesized clade distributed in Japan and western North America. We found that the claw structure used to distinguish families in Nippononychidae varies intraspecifically and is therefore an unreliable character for species delimitation. Alternatively, the male genitalia reveal patterns consistent with the preliminary molecular phylogeny. Our morphological analysis will be used to increase confidence in taxonomic hypotheses, resulting in phylogeny-based reclassifications of higher-level taxonomy in Travunioidea.

469  Poster #43

Variation of carbon use of microbial communities in different microhabitats
Felicia Miller, Biology (U)
Elizabeth Dinsdale, Biology

Microbial communities play an important role in the health of the ecosystem and changing environmental microbial communities results in altered ecosystem function. The type and abundance of carbon based compounds affects the demographic rates of the microbes. Culture experiments have identified that microbes have differing abilities to breakdown different carbon sources and our experiment aims to investigate the response of environmental microbial communities to various carbon compounds. We hypothesize that microhabitats will drive carbon usage ability, rather than geographic location. We will evaluate our hypothesis by testing microbes from two tide pool locations, Ocean Beach and Mission Beach, on three carbon sources; malic acid, cellobiose, and erythritol. From each tide pool location we will collect microbes from three different microhabitats, water column, hermit crabs, and algae. In order to compare differences in nutritional abilities based on tide pool location or microhabitat (water, hermit crab or algae), we will grow the microbes on the three carbon sources and identify the proportion of microbes able to grow on each source. The proportional differences across the plate types will be tested using a 2 factorial ANOVA, with microhabitat nested in location. We predict that the samples collected from each microhabitat will have different utilization of the carbon sources and that the sites that we sample from will not affect the usage of carbon sources by these three microhabitats. Our findings will describe the nutrient usages of microbial communities in differing environmental conditions and microhabitats. Our results suggest that these CBM tasks may be comparable to exposure tasks in assisting individuals with obsessive-compulsive symptoms approach feared objects.

470  Poster #44

Phenotypic analysis of 20 marine Vibrio spp. isolated from kelp forests offshore San Diego, California
Tucker Lopez, Environmental Health (M)
Elizabeth Dinsdale, Biology

Marine microbes aid in the nutrition, reproduction, chemical defense, and immunity of associated organisms in marine ecosystems. However, the full extent of each bacteria phenotypic capacity has not been explored. Our research explores the phenotypic adaptations in isolates similar to Vibrio splendidus, Vibrio cyclitrophicus, & Shewanella sp. cultured from four kelp forest regions offshore San Diego, California. The growth ability of each bacteria was tested on 72 carbon and 24 nitrogen sources. 91% of the Vibrio studied grows in Alpha-D-Glucose, D-Mannose, D-Glactose, Glycerol, Lactate, L-Glutamine, & Trehalose Carbon sources. 50% of all Vibrio grow in Adonitol, D-Xylose, L-Aspartic Acid, and Putrecine Carbon sources. Furthermore, none of the Vibrio studied grow in Oxalic acid. 87% of the Vibrio studied grew in Cytidine Nitrogen Source, 50% in Adenine, Biuret, Guanidine, Histamine, L-Pyro-Glutamic acid Nitrogen sources. The lowest growth was observed in Beta-Phenylethylamine and L-Glutathione Nitrogen sources with 41% growth of the Vibrio studied. It is hypothesized that microbial strains isolated from higher anthropogenic disturbed areas will show increased carbon...
and nitrogen utilization. As a result of this study, we will be able to better predict the changes that will occur in microbial communities with different anthropogenic influences which have implications on the health of the associated environment and macro-organisms. This study is relevant as anthropogenic perturbations continue to increase in frequency and magnitude worldwide.

471 Poster #45
**The Addition of Coral Reef Invertebrates to the Microbialization Score**

Joel Huckeba, Biology (U)
Forest Rohwer, Biology

Microbialization is the process by which microbes replace macro organisms on a coral reef and metabolize the majority of the bioavailable energy. The microbialization score is a practical metric for evaluating and comparing reef health as there is a direct relationship between the increase in microbial metabolism and the cumulative human impact on the ecosystem. As of now the microbialization score only accounts for the biomass of fish and microbes in coral reefs, neglecting other organisms. However, invertebrates are known to significantly contribute to trophic dynamics in coral reefs. To further the accuracy of this metric, the body dimensions of Gastropods and Crustaceans were measured and applied biometric regressions that convert the length and width of the respective organism to its wet weight. These measurements were then applied to the Metabolic Theory of Ecology, an equation that predicts the organism’s metabolic rate based on its body size and temperature. The average abundance of Gastropods and Crustaceans was then assessed by analyzing benthic time lapse images and used to calculate the invertebrate metabolic rate on the reef. This determined invertebrate metabolic rate was then added to the already existing microbialization score calculations. The addition of reef invertebrate metabolic rates will enable further accuracy of the microbialization score, and allow for a more comprehensive assessment of the status of a coral reef.

472 Poster #46
**Genetic and Phenotypic Analysis of Gammaproteobacteria**

Blaire Robinson, Bioinformatics and Medical Informatics (M)
Robert Edwards, Computer Science

Microbial organisms have been a long studied, but minimally understood topic of biology. Previous studies of microbes have been fully based on microbial biochemistry, investigating microbial phenotypic growth characteristics. More recently, with the advancement of genetic sequencing, microbial analyses have transitioned to gene-based analysis. True scientific discovery lies in the fusion of microbial genetic and biochemical information to form new understandings of microbial processes and significance. The aim of this study is to identify strains of Gammaproteobacteria that are genetically similar, but display varying phenotypic profiles, and investigate the genetic source of functional variation. Bacteria from three southern California kelp forests were cultured, genetically analyzed, and tested for phenotypic and biochemical properties. Phylogenetic association was formulated using 16S ribosomal RNA sequence analysis in order to identify genetically similar strains using Genome Peek and Rapid Annotation Using Subsystem Technology (RAST) services. Phenotypic properties were tested and compared to identify areas of functional difference between genetically similar species. Further genetic analysis of selected strains will be performed using various bioinformatics tools to analyze individual strain structure, metabolism, proteomics, functional subsystems, and genomes with the goal to identify the cause of phenotypic variation. Expected sources of phenotypic variation include, but are not limited to, loss of function mutations, gain of function mutations, modulation of cellular networks, and prophage presence or variation. Analysis of the basis of phenotypic and genetic variation can lead to further understanding of the source of said variations in the environment, how variation affects cell survival, and if variation is ecologically significant to kelp health. This project has been funded in whole or in part with federal funds from the National Science Foundation.

473 Poster #47
**Elucidation of the Function of Unknown Marine Viral Genes**

Indrajee Wewaliyadda, Microbiology (M)
Anca Segall, Biology

Viruses are the highest abundant entity in our environment. Bacteriophages (Phages) are highly abundant in the marine environment and they play a critical role in contributing to the dissolved organic matter in the ocean. These phages are diverse and produce a huge number of new proteins. The function of most of those proteins is yet to be discovered.

We have used Artificial Neural Nets (ANNs) to predict structural and none structural proteins. These unknown predicted none structural phage genes were cloned into a plasmid and expressed them in *E. coli*. We have developed a stress screen assay using multi-phenotypic assay plates (MAPs) to grow clones exposed to environmental stresses such as pH, oxidase, phosphate or iron stresses. The growth of unknown phage genes was compared with the reference genes (from ASKA and Global Oceanic Survey study). We have observed improved growth or reduced growth in some situations due to the expression of the phage gene. Physiological changes were compared using metabolomics. Putative unknown phage genes that showed similar growth characteristics to reference genes were further investigated using physiological tests. We have observed that phage gene EDT
5953 from Southern Lines Islands – Starbucks showed similar characteristics to the transcription dual regulator fur of E. coli. Thus, the use of stress screens in combination with metabolomics and MAPs provide a robust method to characterize unknown phage genes.

474 Poster #48

Characterization of Migration in Human Astrocytes Following Bacterial Infection

Anna Lehmann, Biology (U)
Kelly Doran, Biology

Astrocytes are characteristic star-shaped glial cells in the brain and spinal cord. The proportion of astrocytes in the brain ranges from 20% to 40% of all glia. They perform many functions, including biochemical support of endothelial cells that form the blood–brain barrier (BBB), provision of nutrients to the nervous tissue, maintenance of extracellular ion balance, and a role in the repair and scarring process of the brain and spinal cord following traumatic injuries. Little is known about the interaction and response of astrocytes to bacterial infection despite being one of the most abundant types of brain cells. However, in the context of brain injury, astrocytes have been shown to migrate to the site of the insult during a process called astrogliosis. For this reason, we hypothesize that astrocytes may respond in a similar fashion during infection. Here we examine the migration response of astrocytes to the leading neonatal meningial pathogen, Group B Streptococcus (GBS). We used an astrocyte cell line, SVGA, to characterize migration in vitro. We have found, by RT-qPCR, that during GBS infection astrocytes upregulate the expression of genes that are strongly associated with cell motility, including matrix metalloproteinases (MMP)-2 and MMP-9. These are known to break down the extracellular matrix in between cells, facilitating cell migration through tissue. Additionally, we found that internalization of GBS is not necessary to induce MMP expression. Experimentation using gelatin zymography, a technique that measures enzyme levels, will confirm the presence of MMP activity. Finally, we have performed microscopic imaging techniques to directly observe the migratory status of astrocytes in response to GBS as well as in response to other GBS infected cell types (BMEC). Taken together, these experiments will shed new light on the response of astrocytes to bacterial infection of the CNS and the development of inflammation during neonatal meningitis. Future work will focus on determining the impact of astrocyte migration on BBB function in vivo, using a mouse model of bacterial meningitis.
Poster #50
The Importance of Supplier Evaluation Ratings and the Quality of Goods Supplied to the Engineering Procure Construct Industry
Panthil Desai, Construction Engineering (M)
Thais Alves, Civil, Construction and Environmental Engineering

In today's globalized world, construction companies depend highly on their suppliers and the effective management of their supply chain to deliver goods and services. In order to ensure the success of a construction project, companies need suppliers who can reliably and consistently deliver quality goods. Thus, this study, which is part of an undergraduate's thesis, addresses the problem of effectively selecting and managing suppliers in the Engineering-Procure-Construct (EPC) industry and it is part of an extensive research project being conducted by Construction Industry Institute team research team (RT) 308: "Achieving zero rework through effective supplier quality practices". RT 308 subject matter experts (SMEs) selected four material types that are present in virtually any EPC project, namely: engineered/tagged equipment, structural steel, pipe spools, and non-engineered/bulk valves. Four stages in the supply chain of these materials were defined to gather data about the quality of the products, represented by the number of non-conformances (NCs) found in each stage: 1) execution at the shop; 2) release from shop; 3) receive at site; and 4) mechanical completion (when the project is passed on to the client). Stages 1 and 2 happen at the shop, whereas 3 and 4 happen at the construction site. For this study, only structural steel and pipe spools were considered. Data were collected from construction companies and owners in the EPC industry using an online instrument, in which respondents entered actual data coming from purchase orders from past projects. Data were analyzed using IBM SPSS to run Mann-Whitney (M-W) tests on the non-parametric dataset. Results show that companies that use ratings of prior supplier performance catch more non-conformances across all four stages of the supply chain and prevent problems from reaching the use phase of the projects. Additionally, results reveal a medium to strong relationship between the use of prior performance ratings and identifying non-conformances. Currently, the RT is conducting additional literature review on supplier evaluation and selection, and collecting additional data from EPC companies to evaluate the relationship between specific supplier evaluation criteria and the resulting quality of products delivered, measured by the number of non-conformances.

Poster #51
Exploration of Surrogate Models for Inverse Identification of Delamination Damage in Composites using Electrical Resistance Change
Paulina Diaz Montiel, Aerospace Engineering (M)
Satchi Venkataraman, Aerospace Engineering and Engineering Mechanics

Carbon Fiber Reinforced Polymer (CFRP) materials are used in aerospace structures due to its superior mechanical properties and reduced weight. Non-destructive evaluation (NDE) techniques to detect and measure internal inter-ply delamination and intra-ply matrix cracking damage are needed for such materials. The electrical resistance change (ERC) provides a NDE technique that uses the inherent changes in conductive properties of the composite to characterize damage.

This research investigates efficient numerical modeling techniques for inverse identification of delamination damage location and size in composite laminates using ERC based NDE. Identification of damage requires performing an optimization that minimizes the difference between the model predicted and the measured change in resistance at specified electrode locations. Using numerical finite element model of the laminate directly in the optimization is computationally expensive and requires the development of an accurate surrogate model. The objective is to achieve a high precision detection model for delamination cracks in a composite laminate and to quantify a measurement that could characterize the damage state of the material.

This paper presents a comparison of different surrogate modeling approaches and model reduction techniques for the ERC based damage detection. Surrogate models evaluated include polynomial response surfaces, kriging, and an adaptive-sparse polynomial dimensional decomposition method. The use of model order reduction through singular value decomposition (SVD) and the accuracy of using SVD components to fit surrogate is also explored.
478  Poster #52
Experimental Comparisons of Progressive Failure Damage in Composite Laminates at Countersunk Bolted Joints Loaded Using Different Bearing Test Fixtures
Alexandru Popescu, Aerospace Engineering (M)
Satchi Venkataraman, Aerospace Engineering

Composite materials are widely used in the aerospace industry due to their superior stiffness and weight-savings compared to metals. The failure of these composite laminates at fastener sites has been a long recognized as a problem and investigated by many researchers. The focus of this work is on countersunk bolted joints in composite laminates. Countersunk fasteners are preferred in aerospace to satisfy aerodynamic smoothness of airframe or wing outer surface. The ASTM D5961 procedure C is recommended to use in testing countersunk composite joints. In this paper we perform bearing tests of laminated composites, using a modified ASTM D5961 fixture designed for testing countersunk bolted joints. The progressive failure behavior and the damage resulting from the modified test fixture are quantified and compared to laminates tested using the standard ASTM D5961 Procedure A and Procedure C. Finite element analysis investigation of bolted joint tests using the above mentioned three fixtures has shown that in countersunk fasteners the bearing load is transferred primarily through the non-countersunk hole region, the bending deformation of the fastener or pin leads to significant localization of stresses, and the bending of the pin and the test fixture lead to significant out of plane compressive stresses. In this research we experimentally characterize the progressive damage accumulated during bearing tests using the three test fixtures. Preliminary test performed on a AS4/3501-6 graphite epoxy material composite 36 ply laminate with stacking sequence [-45/45/90/0/±45/0]_2 shows significant differences between the standard and modified tests. In standard bearing tests with straight pins the final bearing failure is characterized by a sudden load drop. Countersunk specimens do not exhibit a large load drop at the bearing failure, and continue progressively damaging. The tested specimens are inspected non-destructively (C-scan) and destructively by microscopy imaging of the specimens after sectioning to characterize and quantify the damage.

479  Poster #53
Wrestlebrainia
Brett Musolf, Mechanical Engineering (U)
Karen May-Newman, Mechanical Engineering

The educational mission of the NSF/ERC Center for Sensorimotor Neural Engineering (CSNE) is to train future engineers in neural engineering prosthetics development. In accordance with this mission, an outreach project was collaboratively designed among the three partner universities: SDSU, MIT and the University of Washington. The project, called “Wrestlebrainia”, introduces high school students to the principles and skills important for understanding CSNE research. The project was originally developed at MIT, but implementation faced several technical obstacles with a few issues needing to be addressed.

Wrestlebrainia allows two players to compete using their EMG signals to power a motor attached to a lever that can depress buttons located on either side to confirm the winner. The project consists of an Arduino microcontroller connected to a motor driver board that controls the motor apparatus. The motor apparatus (shown in Fig. 1) consists of a bar mounted on the motor axis, which rotates in response to input from EMG electrodes. The electrodes attach to an EMG board that connects to the Arduino. The players attach the electrodes to their biceps muscle, calibrate, then contract as much as possible to rotate the lever to the winning position. Each Wrestlebrainia unit has over 3 dozen components, and requires soldering, programming and an understanding of biomechanics.

The preliminary testing groups at SDSU had limited success in the construction of the assembly. A few errors in crucial parts of the construction both inherent in the original instructions (e.g. errors in code) and on the part of the students (e.g. poor soldering) led to the high failure rate. Following troubleshooting, one existing prototype consistently runs and provides a platform to assess simplifications and improvements.

This outreach activity will be tested by four high school and four middle school students at SDSU. Following this, the instructions for assembly will be revised to make the project more appropriate for the students. Evaluations will be developed to assess how well this activity ac-complishes and contributes to the educational mission of the CSNE.
Session C: Poster Presentations

Session C-9
Poster: Analytical Chemistry
Friday, March 4, 2016, 12:30 – 2:00 pm
Montezuma Hall

480 Poster #1

Comparison of the voltammetry of 4 and 5-nitroimidazoles. Implication for the medicinal activity of nitroimidazole.

Andrew Nguyen, Chemistry (U)
Diane Smith, Chemistry

Nitroimidazoles are biologically active compounds that also have medicinal uses. 5-Nitroimidazoles are currently used as anti-bacterial drugs and a 2-nitroimidazole is used to treat Chagas disease. The nitroso and hydroxylamine, which are reduced forms of nitroimidazoles, are believed to be the active anti-bacterial agents. Compared to the 2- and 5-nitroimidazoles, 4-nitroimidazoles are known to be inactive under biological conditions. In this project cyclic voltammetric analysis of a simple 4-nitroimidazole, 1-methyl-4-nitroimidazole, is currently being run to analyze the stability of its reduction products under biological conditions and their reactivity with cysteine. Previous studies of the 4-nitroimidazole have been done in DMSO with cysteine additions because it is believed that the reaction of nitroimidazole with cysteine is the likely cause of cell death in bacterial species. The cyclic voltammetric analysis between the 2-, 4-, and 5-nitroimidazoles in DMSO with cysteine additions yielded similar trends of reduction and oxidation potential. Between the 4- and the 5-nitroimidazoles, the 4-nitroimidazole is shown to have a more negative reduction potential than the 5-nitroimidazole. This difference in reduction potential might be the cause of the 4-nitroimidazole inactivity under biological conditions. Currently the 4-nitroimidazole is being analyzed under aqueous conditions with cysteine additions. This change from DMSO to an aqueous solution allows for further analysis of the compound under biological conditions.

481 Poster #2

Combining Capillary Electrophoresis and a Novel Microfluidic-Droplet Device to Detect Fluorescent Biomolecules

Eduardo De La Toba, Chemistry (U)
Christopher Harrison, Chemistry

Microfluidic-droplet devices are a useful method for manipulating small volumes of chemical compounds. To make these devices even more effective and versatile, they can be connected to chemical separation methods, such as liquid chromatography and capillary electrophoresis (CE). CE is a high resolution separation technique that separates chemical compounds inside a narrow capillary tube through the use of an electrical potential, wherein compounds separate if they have different electrophoretic mobilities. CE is an efficient analytical technique to couple with microfluidic-droplet devices because with CE only very small volumes of sample are required for an accurate analysis of the composition of a sample. With our inexpensively constructed CE-droplet device each of the analytes can be collected in the form of a droplet, which can then be further manipulated, analyzed, or chemically modified. Limited research has been done on the coupling of CE with microfluidic droplet systems due to the challenges in coupling the two systems, however the potential advantages that can be achieved with a coupled device merit the effort.

The setup of our CE-droplet device consists of a separation capillary into which the sample is electro-kinetically injected. However, unlike in normal CE separations, the design we developed involves a sheath capillary that fits over the separation capillary and leads back into a buffer reservoir in order to maintain a closed electrical circuit. A Teflon tube is attached to the outlet of the separation capillary, with a syringe pump attached to the tube, which continuously pulls silicone oil through the tube. When the separated analytes reach the outlet of the separation capillary, they are engulfed by an immiscible stream of silicone oil, and consequently form droplets, which then flow through the Teflon tube. An epifluorescence camera is positioned to capture any signal from droplets containing fluorescently labeled analytes. This poster will present our characterization of the separation and detection of fluorescently labeled biomolecules with our device.

482 Poster #3

Investigation of Proton-Coupled Electron Transfer in an Imidazole-containing Phenylenediamine Derivative Using Cyclic Voltammetry

Gabriel Sepulveda, Chemistry (U)
Diane Smith, Chemistry

Essential to life’s fundamental, foundational, and chemical processes, are certain reactions in which the two sub-atomic particles, electrons and protons, are transferred. These are referred to as Proton-Coupled Electron Transfer (PCET) reactions. The on-going research in the Smith group focuses on understanding the role of H-bonding, in PCET reactions, through the use of cyclic voltammetry on compounds with strong H-bond interactions. Two of these experimental compounds are: 1.) U(H)H, a p-phenylenediamine-based urea, and 2.) UlmH, basically U(H)H, except a phenyl group is replaced with an imidazole group. Being that these two compounds have a similar base structure, this gives rise to what we are trying to accomplish:
to determine the oxidation reaction of UlmH. Again, with the use of cyclic voltammetry, this should be attainable by comparing the current of U(H)H oxidation to that of UlmH. So far, we know that the oxidation of U(H)H corresponds to 1e⁻/U(H)H, which occurs in a single oxidation wave. UlmH has 2 oxidation waves; however, we are still in the process of experimenting to see if each of these correspond to 1e⁻/UlmH, which is one hypothesis we have formulated. Running the two compounds under the same conditions (same concentration [1mM] and same electrode [platinum]), should allow us to determine this.

483 Poster #4

Sensitive Detection of Proteins and Biomarkers by Nonlinear Laser Wave-Mixing Detection and Capillary Electrophoresis

Mya Brown, Chemistry (U)
William Tong, Chemistry

Ultrasensitive detection of proteins and small molecules is important for the diagnosis of diseases as well as the evaluation of treatment progress. However, current detection methods do not offer adequate sensitivity and specificity levels. We present a novel nonlinear laser method, coupled with capillary electrophoresis, for high-resolution separation and sensitive detection of proteins, biomarkers, small molecules and other biological samples. In a typical laser wave-mixing setup, the signal is generated when two laser beams intersect inside the capillary containing the analyte of interest. The wave-mixing signal is a coherent laser-like beam and can be collected with virtually 100% efficiency and minimal background noise. The signal has a cubic dependence on laser power and a quadratic dependence on analyte concentration, and hence, it is inherently suitable as a chemical sensor. A visible laser is used first to align the wave-mixing optical setup using NBDX-labeled beta-lactoglobulin. A 75 µm i.d. fused silica is then introduced to the wave-mixing setup for separating biomolecules of interest. A standard protein ladder labelled with NBDX is also separated and detected using capillary electrophoresis and wave mixing. A breast cancer prognostic marker, CA 15-3, labeled with NBDX, is also detected using laser wave mixing. We have also demonstrated femto-mol or zepto-mol detection levels for other proteins and small molecules such as neurotransmitters. Acknowledgment: We acknowledge partial support of this work by the NIH (R01), NICMS IMSD (2R25GM058906), NSF, U.S. Dept. of Defense, Army Research Office, and U.S. Dept. of Homeland Security.

484 Poster #5

Photochemical Study of Silver Nanoparticles Formed from the Reduction of Silver Ions by Humic Acid

Renee Leslie, Chemistry (M)
David Pullman, Chemistry

This study investigated the formation and stability of silver nanoparticles (AgNPs) formed from the reduction of silver ions by humic acid in the presence of UV and visible light. The interest in AgNPs comes from an increased concentration of silver nitrate in the presence of UV and visible light. The rate of AgNP growth increased linearly as the concentration of humic acid or silver nitrate was increased. AgNP growth was monitored by UV Vis and AgNP size was monitored by dynamic light scattering. This study demonstrates the potential for silver ions to reform nanoparticles which can disrupt sensitive ecosystems.

485 Poster #6

Post Traumatic Stress Disorder as a Causal System

Alejandro Ortiz, Psychology (U)
Nader Amir, Psychology

Psychological theories of Post Traumatic Stress Disorder (PTSD) suggest that a latent construct causes and is quantified by the symptoms (DSM-5; APA, 2013). Recently psychometricians have turned to a different approach to understand mental disorders such as PTSD: looking at mental disorders as causal systems (Borsboom & Cramer, 2013). According to this approach, a stressor (trauma) causes a symptom, which may cause other symptoms and in turn be affected by those symptoms, and so on. These symptoms themselves constitute the mental disorder, such as PTSD. For example, McNally et al. (2014) used network analyses of the PTSD symptoms in 362 earthquake survivors (38% met criteria for probable PTSD) showing that feeling distant from other people was linked to loss of interest in previously enjoyable activities as well as emotional numbing. Difficulty sleeping, hypervigilance, and being easily startled were also clustered as interrelated symptoms. In the current study, we replicated and extended these network analyses with a larger sample of 6,882
undergraduates. To this end we created a Relative Importance Network, where each edge represented the relative importance of that symptom as a predictor of another symptom (Johnson & LeBreton, 2004). We used a weighted and directed network, i.e. the magnitude of the relation is shown through thickness of the line, and arrows start in the predictor symptom and end in the predicted symptom. The strongest associations were between feeling distant from others and loss of interest in previously enjoyable activities, as well as between sleep difficulty and being easily startled. The associations between these symptoms were the similar to those reported by McNally et al. (2014). These results show how PTSD symptoms are interrelated especially bidirectionally, elucidating a potential causal system structure. The fact that these symptoms may give rise to each other highlights a pattern that may lead to chronicity.

486 Poster #7
The Effect of an Adaptive Attentional Bias Modification Program on Social Anxiety Symptoms
Rodolfo Rodriguez, Psychology (U)
Nader Amir, Psychology

An attentional bias toward threat may be one mechanism underlying social anxiety. Attention bias modification (ABM) aims to reduce symptoms of anxiety by directly modifying this deficit. However, existing ABM training programs have not consistently modified attentional bias and may not reflect optimal learning needs of participants (i.e., lack of explicit instruction, training goal unclear to participants, lack of feedback, non-adaptive, inability to differentiate or target different components of attentional bias). In the current study, we introduce a new adaptive ABM program (AABM) and test its feasibility in individuals diagnosed with Social Phobia. We report the results of a study that examined participants’ ability to change their bias in a game-like attention training program. Preliminary results suggest that participants were able to reach level 120 (i.e., changing their bias by 90 ms on average) of the program and reduced their symptoms of social anxiety (Leibowitz Social Anxiety Scale, LSAS pre = 86.25; LSAS post= 45.12; t(7) = 3.94, p = .006). In addition, the level reached in the program correlated with symptom reduction. These results suggest that an idiographic program that allows participants to move up in levels may be more effective than traditional ABM programs in changing attention bias and thereby, reducing anxiety symptoms.

487 Poster #8
The Approach-Avoidance Task: Relationship between social anxiety symptoms and emotional facial expressions
Jesly Anne Avila, Psychology (U)
Dr. Nader Amir, Psychology

Socially anxious individuals tend to hold negative beliefs about themselves, while having the desire to maintain socially adequate relationships and to convey favorable impression to others (Heur, Rinck, & Becker, 2007). Previous research examined whether individuals with Social Anxiety Disorder (SAD) have increased difficulty approaching neutral (ambiguous) faces compared to disgust faces. Kuckertz and colleagues (in press) utilized the approach avoidance task (AAT) to measure approach and avoidance action tendencies to determine if there were significant differences between the participants’ approach to neutral faces compared to disgust faces. SAD participants showed greater difficulty in approaching ambiguous faces compared to disgust faces. In addition, when participants were intolerant to neutral faces, it predicted the effects of their level of anxiety and depression (Kuckertz, Stroeg, & Amir, “in press”). It is typically expected that socially anxious individuals push away angry faces away more quickly. Heur, Rinck, and Becker, (2007) also found that undergraduates with elevated social anxiety symptoms tend to push away smiling (positive) faces faster during AAT.

In the current study, we examined whether positive faces in comparison to negative faces would have a significant relationship with the participants’ level of anxiety and depression. Our study consisted of 17 participants with Social Anxiety Disorder (SAD) that were trained to complete AAT in order to measure approach and avoidance action tendencies in socially anxious individuals. Participants were provided a joystick, and instructed to pull (approach) or push (avoid) neutral, disgust, and positive faces based on the color of the border surrounding the picture. Our results suggest that there was a marginally significant relationship between a participant’s reaction time to the presentation of positive (compared to neutral) pictures and their level of anxiety and depression. At this point we did not find a significant correlation between a participant’s reaction time to the presentation of negative faces and their level of anxiety and depression. Moreover, our findings show that slower responses to positive faces may marginally increase a participant’s level of anxiety and depression.
Abstracts

488 Poster #9
The Effects of Coping Styles, Exercise, and Attention on Perceived Stress Levels in College Students
Samuel Plantowski, Psychology (U)
Claire Murphy, Psychology

College life can be an overwhelming period of stress where people experience pressure to succeed and look for ways to cope with major life transitions. Perceived stress influences the coping strategies that college students use to adapt to life. Exercise can be an important coping style used in managing levels of perceived stress. Attention can also affect the ability to cope with stressful situations. Researchers have examined the effects of stress on student’s performance and workload; nevertheless, no previous research has assessed the relationship between stress and coping strategies using the Perceived Stress Scale (PSS) and the Strategic Approach to Coping Scale (SACS), and if gender and grade level play an important role. The present study examines the relationships between gender, grade level of college students, attention, and exercise on levels of perceived stress and coping strategies. 132 college students comprised of 76 females (39 underclassmen and 37 upperclassmen) and 23 males (17 upperclassmen and 6 underclassmen) from introductory psychology courses, psychology majors, and a sorority home in San Diego, California were sampled. The data were collected through the online services of Qualtrics and Inquisit. Three questionnaires and one assessment were used: Perceived Stress Scale (PSS), Strategic Approach to Coping Scale (SACS), Exercise test, and Attention Network Test (ANT). The data for PSS, SACS and ANT were analyzed using repeated measures ANOVA to examine gender and grade level. Overall significant difference between males and females were found for PSS and SACS indicating there is an influence of gender on the coping styles they use to manage perceived stress levels. Findings for significant differences in gender could be a result of cultural or societal influences.

489 Poster #10
The Influence of Perceived Social Acceptance and Acculturative Stress While Abroad on Reverse Culture Shock in Study Abroad Participants
Jeremy Schonberg, Psychology (U)
Katherine Turner, Psychology

Research in the past has studied the influence of acceptance and stress on the levels of culture shock experienced by study abroad participants, but few study the influence of these factors on the level of culture shock experienced by participants upon their return. This study examined the relationship between the levels of reverse culture shock upon returning home in study abroad participants, and the perceived social acceptance and acculturative stress experienced while abroad. Data for this study includes both archival and prospective data from participants after their return from study abroad programs. All data was collected through the Qualtrics website. There were three a priori hypotheses. First, it was hypothesized that the level of perceived social acceptance experienced while abroad would be negatively correlated with reverse culture shock. Second, the level of acculturative stress experienced while abroad would be positively correlated with the level of reverse culture shock experienced by study abroad participants upon returning home. The last hypothesis was that students with a multicultural background, who travelled to areas with cultural values that aligned with those to which they were accustomed, would experience lower levels of reverse culture shock than any other group of study abroad participants. These findings have implications for future research in the field of reverse culture shock, as well as in the promotion and creation of mental health resources and programs for study abroad participants upon their return to SDSU.

490 Poster #11
This Effect of Cognitive Bias Modification Interpretation Task on Subclinical PTSD
Nicole Brunn, Psychology (M)
Nader Amir, Psychology

The interpretation of anxiety provoking stimuli may contribute to the maintenance of many anxiety disorders, such as Posttraumatic Stress Disorder. (PTSD) (Dunmore, Clark & Ehlers, 1999) Cognitive Bias Modification has been used to modify a person’s interpretation of threatening stimuli and reduce anxiety-provoking interpretations. (Menne-Lothmann et al., 2014) The goal in the present study was to use a Cognitive Interpretation Training Task to train the participant’s interpretation bias. The participants were undergraduates from San Diego State University with Subclinical PTSD symptoms. Participants are randomly assigned to either the control or training condition. Participants are shown a neutral sentence on a computer screen followed by either a neutral word or a threatening word related to trauma and are asked to indicate if the word and sentence are related. Preliminary results suggest the training was successful in increasing endorsement of benign interpretations. These results were consistent with recent reviews of interpretation training in anxiety (Menne-Lothmann et al., 2014) and extend the findings to PTSD.
Session C-11

Poster: Let’s Take Care of Our Water & Soil!
Friday, March 4, 2016, 12:30 – 2:00 pm
Montezuma Hall

491 Poster #12
Evaluating the performance anaerobic baffled reactor coupled with a membrane for wastewater treatment using fluorescence spectroscopy
Joseph Wasswa, Environmental Engineering (M)
Natalie Mladenov, Civil, Construction & Environmental Engineering

Providing enough water for domestic and other uses continues to be a challenge as the pressure on available resources increases. In addition to such pressure, there is increased generation of wastewater and a concentration effect on waste compounds as the population increases. Handling these new wastewater streams is burdensome as they exceed the design load for some systems. Water reuse is an option that partially solves both water shortage and wastewater handling. Decentralized wastewater treatment systems especially the Anaerobic Baffled Reactor (ABR) may be advantageous in some developed and developing countries because it generates less sludge compared to aerobic means; it consumes less energy to operate; it is cheap and easier to construct compared to large centralized systems; and it is cleaner in terms of CO₂ emission. Such decentralized systems are appropriate for developing countries that have constrained budgets to construct large centralized wastewater treatment systems and may be appropriate for less populated places in developed countries. Although organic compounds are largely removed by the ABR, a main challenge is the removal of pathogens and nutrients. This study therefore seeks to implement and evaluate a membrane as a secondary/tertiary treatment process in a bench-scale reactor fed with artificial wastewater. Although membranes have proved to attain considerable reduction in pathogen and turbidity of the water, they face problems such as fouling and clogging. Most of the sensors that have been used in fouling monitoring employ total organic carbon (TOC), pH and conductivity measurements, which may not adequately capture membrane failure. Some studies have recommended fluorescence spectroscopy as a more effective tool for water and wastewater effluent monitoring in conventional treatment processes due to its selectivity and sensitivity. Little is known about membrane performance for anaerobic systems, which have a different microbial consortium than membranes treating effluent from aerobic systems. In-situ fluorescence monitoring is used here as a tool to monitor changes in both quantity and quality of dissolved organic matter (DOM) in coupled ABR-membrane systems to track membrane performance. Such information can be used to design more reliable and real-time sensors for evaluating the quality of effluent for water reuse.

492 Poster #13
Quantifying Plastic Debris Entering Our Waste Water Treatment Centers
Jannira Gregory, Environmental Engineering (M)
Natalie Mladenov, Civil, Construction & Environmental Engineering

Microplastic debris has become a growing concern over the last decade because the debris is growing and there is minimal research showing what the impacts of these microplastics are in the environment. Microplastics are plastic particles that are typically smaller than 5.0mm. They originate from personal care products, clothing and micro-blast cleaners. These microplastics are emerging in lakes, oceans, seas and rivers worldwide. They are also existing more frequently during the treatment process at wastewater treatment plants (WWTPs). This increase of plastics in our WWTPs is concerning since we do not yet understand if and how the treatment process biodegrades the plastics. The results of this work will help fill in the gaps on how microplastics are removed from the WWTP.

We will quantify plastic debris entering a WWTP by taking three samples from the plant to measure the changes in microplastics through the treatment process. One sample will be taken from the influent, one from the scum removal process and the third sample from the effluent. Using the gravimetric analysis method, the three samples will be measured to quantify the degradation of and the amount of microplastics that remain in the WWTP process.

493 Poster #14
Evaluation of the Biodegradability in an Anaerobic Baffled Reactor using Spectrofluorometry
Amy Bigelow, Environmental Engineering (M)
Natalie Mladenov, Civil, Construction & Environmental Engineering

Finding sustainable solutions to wastewater and sanitation problems continues to be a challenge in areas such as peri-urban slums, which lack the infrastructure and resources to construct and connect to a centralized wastewater system. One solution that is being researched in Durban, South Africa is the use of anaerobic baffled reactors (ABR) in a decentralized wastewater treatment system (DEWATS) to treat low and medium strength
domestic wastewater from communal ablution facilities. Still in the research phase, in-depth analysis was needed to assess the viability of operating the system full scale in real-time. The purpose of this study was to determine biodegradation rates in each ABR chamber and relate that to biodegradability estimates using 2D and 3D fluorescence spectroscopy to produce a biodegradability profile of the DEWATS under realistic conditions.

Biodegradability experiments were set up using samples from nine different locations in the Durban ABR. Samples were evaluated primarily using 3D fluorescence spectroscopy with main interest in the change in peak intensities of a tryptophan-like (TRP-like) peak appearing at 285 nm excitation / ~350 nm emission, which is known to represent biologically-labile organic matter. This data was then supported by dissolved organic carbon (DOC) analysis and microbial growth assays.

Based on first order degradation processes, the greatest biodegradation was expected to occur in the early stages of the treatment process and decrease in subsequent stages. Indeed, in the first seven chambers of the ABR, peak 3D fluorescence intensities decreased by 61.8% from 36.3 to 13.9 RU, 2D fluorescence intensities decreased by 26.9% from 1071.1 RFU to 700.8 RFU, and DOC concentrations decreased by 30.2%, from 34.9 mg/l to 27.4 mg/l. These results help to evaluate fluorescence as a tool to support decision making when determining the configuration of similar DEWATS in other developing countries where sustainable sanitation is a concern.

**495 Poster #16**

**Swell Mitigation with Granulated Tire Rubber Packs**

Ricardo Ramirez, Civil Engineering (U)

Julio Valdes, Civil Construction and Environmental Engineering

Expansive soil swell produces unwanted structural deformations which in turn cause massive economic losses around the world. Various methods exist to mitigate swell; however, such methods are cumbersome, expensive, and often involve mixing the soil with additives; such mixing is energy-intensive. This work offers a novel technology where no mixing is involved. The proposed technology—as conceived in the laboratory—centers on the placement of a cylindrical granulated rubber pack in a cavity at the center of the specimen. Upon wetting, the swelling soil compresses the pack radially-inwards, which translates to reduced axial swell. Upon drying, the pack expands radially-outwards as the soil shrinks. The results gathered indicate that specimens fitted with rubber packs swelled 50% to 75% less than analogous specimens fitted with sand packs. These results point to the potential of using rubber packs in the field to tailor swell directions and thus, to reduce damage caused by soil expansion.
Session C-12
Poster: Sociology
Friday, March 4, 2016, 12:30 – 2:00 pm
Montezuma Hall

496  Poster 17#
Income Disparities Between White Alumni and Alumni of Color: A School of JMS Study
Kelly Lee, Journalism: Public Relations (U)
David Dozier, Journalism and Media Studies

This study examines income differences between white alumni and alumni of color in the School of Journalism & Media Studies (JMS) at SDSU.

Methods: The study combined qualitative and quantitative research. Population of study was alumni of the School of JMS from 1950–2015. Forty-one face-to-face qualitative depth interviews were conducted between August-September 2015. Findings of the depth interviews were synthesized into an online questionnaire distributed to alumni. Respondents were solicited by e-mail addresses obtained from the School of JMS. Final sample size was 973, with a four percentage point margin of error. Completion rate for the valid sample was 22.5%. Findings: White alumni earn higher incomes, on average, than alumni of color. This is explained, in part, because white alumni have more professional work experience than alumni of color, leading to higher incomes. Public relations (PR) majors (including military PAOs) report higher incomes than do other majors, and media studies reported the lowest annual incomes. White alumni majored in PR more than alumni of color, while alumni of color majored in media studies more frequently. Unadjusted average annual income for white alumni is $118,815 annually, while the average for alumni of color is $103,426. The difference is statistically significant. After controlling for the influences of choice of major and professional experience, the adjusted annual income for white alumni is $117,706; adjusted income for alumni of color is $109,238. While not statistically significant, alumni of color in the sample earn $8,468 less per year than their white counterparts, after controlling for major and years of experience. Discussion: White alumni earn higher incomes than alumni of color, partially explained by the increasing ethnic diversity of the School of JMS. In the sample, younger alumni of color are compared to older white alumni with more professional experience. Some majors in the School of JMS earn higher incomes (i.e. PR) than others (i.e., media studies). JMS students of color might consider income potential in selecting among the four majors in the School of JMS.

497  Poster #18
Mapping Creativity Via Standardized Criteria
Emma Frivold, Psychology (U)
Radmila Prislin, Psychology

Creativity is conventionally portrayed as a catalyst for innovation and evolution, embodying qualities such as novelty, unconventionality, and persistence. Creativity is also intertwined with divergent thinking—characterized by a fluency and flexibility of ideas—and deviance. A common theme across these conceptualizations of creativity, though, is its highly subjective nature, stemming from natural interindividual differences. When assessing responses to visual creativity tasks, it may then be of some utility if standardized methods for assessing the creativity of responses could be established. We therefore sought to determine if coding categories map onto visual creativity. In a task requesting the creative arrangement of a square, triangle, and circle we predicted that significant differences in level of creativity for responses will be found in categories involving representativeness of responses, use of space, following directions, use of the square, and nature of object arrangement. 193 undergraduate participants completed a visual creativity task where they were instructed to arrange three given shapes in a creative, unique way. 97 participants rated these responses for level of creativity. The visual responses were coded by three experts and were rated for 11 criteria. It is expected that the responses will be significantly more creative when they are clearly representative, do not follow directions, are centered, the square is used as a diamond, and when the shapes are arranged horizontally, vertically, or diagonally. It is further expected that responses will be less creative when they are clearly abstract, do follow directions, are spread out, the square is used regularly, and there is no order to the arrangement. Establishing a correlation between selected categories and level of creativity will provide a measure to assess varying levels of creativity in environments such as the workplace and educational systems. The findings of this study will provide further insights in establishing a standardized test measuring creativity. Identifying underlying associations between these coding categories and creativity will provide a means by which the creativity of responses to this task may be predicted with relative accuracy.
498  Poster #19

*Campus Sexual Assault: Rape Myth Acceptance and Reporting Among Victims*

Nicole Meda, Psychology (U)  
Audrey Hokoda, Child and Family Development

Sexual assault, defined as any unwanted sexual experience, is a serious problem on college campuses, with about one in five college women (Sinozich & Langton, 2014) and one in 16 college men (Krebs et al., 2007) experiencing unwanted or uninvited sexual contact. Female student sexual assault victims (12%) were more likely to report than female victims who were not students (5%) (Sinozich & Langton, 2014). Many researchers have studied the relationship between rape myths, (i.e., false beliefs about rape shaped by prejudice) and attribution of blame (e.g., Eyssel & Bohner, 2011; Grubb & Turner, 2012; Kopper, 1996), but few studies have examined the relationship between rape myth beliefs and victims’ reporting (Egan & Wilson, 2012; Heath et al., 2013). The purpose of this study was to analyze the effect of rape myth beliefs on male and female sexual assault victims’ likelihood of reporting the incident to anyone or to authorities. Data were collected through an online survey of 9,161 students at a large Western university, recruited through emails sent to every student, as well as through social media and word of mouth. The survey included the updated Illinois Rape Myth Acceptance (IRMA) scale, and Sexual Assault victimization was measured using one item, “Since becoming a student at SDSU, have you been a victim of any sexual assault?” Two items, “Did you tell anyone about the sexual assault?” and “Did you report the incident to any SDSU staff, faculty, or authorities?” were used to assess reporting. The data were filtered for victims, and the final sample included 38 male and 375 female self-reported sexual assault victims (n = 416). Gender did not significantly predict reporting, while rape myth acceptance significantly predicted reporting to anyone, \( b = .007, t(399) = 3.894, p < .001, \) and to authorities \( b = .003, t(397) = 2.382, p = .018. \) The results are discussed in terms of implications for sexual assault education and resources.

499  Poster #20

*Taking Further Steps To Prepare Undergraduate Social Work Students To Serve Culturally Diverse Populations*

Kbreaun Watkins, Social Work (U)  
Antwanisha Alameen-Shavers, Africana Studies

The purpose of this research is argue a strong case for additional cultural training courses that can function to help prepare undergraduate social work students to engage with culturally diverse populations in the field of child welfare services. Through my research, I find it that African American, Native American, and Latino children are removed from their homes and placed in foster care at higher rates than Caucasian children. Several explanations were found for this, including a positive relationship between child removal rates and socioeconomic status, financial incentives in federal laws pertaining to child removal, and the demonization of black motherhood or single parenting. By examining the School of Social Work’s 44-unit requirement and course curriculum to obtain a Bachelors of Social Work degree from San Diego State University, my research finds it that only one three-unit course is offered to students that focuses solely on a curriculum of “understanding social work as a culturally directed profession with emphasis on the concept of cultural identities created by one’s values, ideologies, knowledge and behavior”. My research also finds attempts within several courses to encourage social work practice with diverse populations, as it is mandated by the Educational Policy and Accreditation Standards Competency Two for Bachelors and Masters of Social Work programs to “apply and communicate understanding of the importance of diversity and difference in shaping life experiences in practice at the micro, mezzo, and macro levels, present themselves as learners and engage clients and constituencies as experts of their own experiences; and apply self-awareness and self-regulation to manage the influence of personal biases and values in working with diverse clients and constituencies”. However, this requirement is hardly met as instructors fail to delve significantly into cultural topics, and is evident in the attitudes, prejudices and views of current social work students on minority populations. Factors that may contribute to reluctance or unpreparedness of social work students to serve minority populations in child welfare services is lack of student readiness to discuss race, oppression, structural disadvantages, and privilege, and respond through resistance to the material. Another is course instructor defensiveness, discomfort, and denial as common reactions to the presentation of diversity material in coursework. My suggestion is to incorporate courses from other liberal arts based programs such as Chicano Studies, Africana Studies, American Indian Studies, and Asian Studies offered at San Diego State University. These courses are taught from a centrally located perspective in the culture and social work students will not only benefit from learning about different cultures, but will expand on critical thinking skills to point out potential barriers of that group’s client behavior in a social work setting.
Pronoun Use and Student Turn-Taking in Academic Lectures
Stephanie DeVeria, Linguistics and Asian/Middle Eastern Languages (M)
Eniko Csomay, Linguistics and Asian/Middle Eastern Languages (M)

Academic lectures are one type of discourse in the university classroom setting. Specifically, in lectures, the instructors typically hold the floor and hold their turns for an extended period of time. In the language they use, personal pronouns may be informative about the power dynamics between the instructor and the students, the two participants in classroom discourse. Previous studies on pronoun use in academic lectures have focused on instructor pronoun use. The findings of these studies varied in which pronouns were more prevalent. For the current study on exploring the use of personal pronouns in lectures, a corpus was compiled from the online lectures delivered by Yale, and is called the “Yale Corpus.” The Yale Corpus, consists of 11 disciplines, 12 courses in total, and is from the Open Yale Lectures which is an online series of publicly available lectures. Personal pronouns were counted and normed for comparison purposes across disciplines. Also, the present study distinguished between instructor and student turns. This study hypothesized that there is a relationship between pronoun use and student participation in academic lectures. Csomay and DeVeria (2016) find that increased pronoun use in instructor turns tends to co-occur with an increased amount of student turns and increased pronoun use in student turns tends to co-occur with longer student turns. This has great pedagogical implications for university classrooms. In addition, the amounts of pronoun use may differ according to disciplines as different disciplines show different patterns of use.

Session C-13
Poster: Nursing
Friday, March 4, 2016, 12:30 – 2:00 pm
Montezuma Hall

IV insertion and Maintenance Infection Prevention
Amy McGuinness, Nursing (U)
Dorothy Zirkle, Nursing

Peripheral Intravascular Cannulas are crucial in today’s modern medical practice. Approximately 30 million patients each year receive IV therapy. Catheter related blood stream infections (CRBSI) occur about 675.00 times per year which is about 1,850 that occur per day (DelPrete). This extensive amount of infections occurring per day is alarming because an infection, on average, adds three to ten days onto the patients hospital stay not to mention the cost in resources that the hospitals have to pay when an infection occurs within the hospital (Aziz). Using a systematic review, we reviewed 6 articles (n=6) to be able to implement interventions to improve peripheral IV catheter care on insertion and management in order to decrease this massive incident of infections. Many of the articles gave similar information on effective IV insertion and maintenance. Based on the research we have conducted, we believe the best education tool to teach staff would be the acronym of H.A.N.D.S. because it encompasses many of the different aspects of IV maintenance and insertion methods that were talked about in each article and is the easiest way for staff to remember these different methods, increasing the chances that they will actually implement them. The goal of H.A.N.D.S. is to prevent catheter related blood stream infections by using these five interventions.

Nursing attitudes toward physician-assisted suicide
Anthony Interrante, Nursing (M)
Catherine Madani, Nursing

Recently, California legislation passed that would permit physicians to facilitate the death of terminal patients. In an era where patient autonomy is paramount, nurses play pivotal roles in caring for and perhaps assisting in the death of these patients. This legislation, however, is in direct contrast to the formal position of the American Nurses Association, who vehemently opposes nurses taking active roles in physician-assisted suicide (PAS). This research brings to light the dichotomy nurses practicing in California face. Furthermore, mindfulness is explored in relationship to these attitudes. The authors in the following research design propose to study the relationship between levels of nursing licensure, mindfulness, and attitudes about PAS. The investigators of this study hypothesize the majority of nurses today, pre and post-licensure, will favor allowing a mentally competent patient to be the executioner of their own death if faced with terminal illness or suffering, and a positive correlation with level of mindfulness in those nurses will exist.

A non-experimental, correlational, cross-sectional research design has been conducted. In looking at the attitudes of pre and post-licensure nurses toward assisted suicide and how those attitudes relate to mindfulness, this design is an appropriate approach. This study proposes to survey a specific population to gain knowledge of their views and inquire as to whether there is a relationship between those views and the concept of mindfulness. There is no independent variable to manipulate, making the design non-experimental. Furthermore, the proposed design is cross-sectional, as pre and post-licensure nurses will be surveyed at a discrete point in time.
Data will be collected through the completion of two surveys-the Attitude Towards Euthanasia (ATE) Scale, which measures support for various reasons for physician-assisted suicide and the Mindful Attention Awareness Scale (MAAS), which is designed to measure mindfulness. A third questionnaire collects demographic information. The intended result of this data collection is to determine whether a correlation exists between demographic factors, mindfulness, and support for legal PAS, as well as to determine an overall rate of support for legal PAS.

This research is ongoing and data analysis is in progress. The researchers hope to have finalized results by early Spring 2016.

505  Poster #26

Buffering the Effects of Role Conflict on Strain: Personal and Contextual Moderators

Noelle Devlin, Psychology (M)
Mark Ehrhart, Psychology

Work-related stress is a growing concern for today’s work force due to the negative effects on the personal well-being of employees. Health service careers are known to be susceptible for work-related stress because they work in a constantly changing environment with several different sources of stress. This is particularly the case in nursing, and especially in first-level management positions that have high levels of role conflict from trying to support the nurses they supervise while also meeting the goals of hospital upper management. Role conflict has been associated with a number of negative outcomes, including lower job satisfaction, lower employee engagement, and higher burnout. To help improve nurse leaders’ well-being, it is important to understand the factors that may buffer the negative outcomes of stressors like role conflict. The present study examined whether the effects of role conflict on job satisfaction, employee engagement, and burnout were moderated by the personal and contextual moderators of resilience and stress reduction climate perceptions. It was hypothesized that the negative effects of role conflict would be reduced when nurse leaders were higher in resilience or when they perceived that there was a stress reduction climate. Archival survey data from a sample of 688 nurse leaders were analyzed using moderated multiple regression. The results indicated that when nurse leaders had higher levels of resilience, the effects of role conflict on burnout and job satisfaction were weakened. In addition, when nurse leaders perceived a stronger stress reduction climate in their unit, there were also weaker negative effects of role conflict on nurse leader job satisfaction and employee engagement. The implications of the findings will be discussed.

Session C-14

Poster: Physical Therapy

Friday, March 4, 2016, 12:30 – 2:00 pm
Montezuma Hall

506  Poster #27

Overground bionic ambulation in able-bodied individuals

Brianna Swanson, Kinesiology, Pre-Physical Therapy (U)
Antoinette Domingo, Physical Therapy

Commercially-available wearable, lower limb exoskeletons have been recently developed to enable over ground walking in individuals with weakness and paralysis. Previous studies have shown these devices contribute to improved bowel function, pain and life satisfaction in people with complete spinal cord injury. One type of exoskeleton, the Ekso, provides variable levels of assistance during walking with a prescribed trajectory, allowing the individual who has any residual motor function to use their own strength during walking. The first step into understanding the effects of variable assistance on motor learning is to measure how able-bodied individuals adapt to using the exoskeleton, without the confound of varying levels of diminished sensation and strength. The aim of this study is to understand how muscle activity and joint angles differ during walking in the Ekso with variable assistance compared with normal walking. We hypothesized that the muscle activity and joint range of motion would be greater when walking in the exoskeleton because of the requirements of following a prescribed trajectory of the exoskeleton. Fifteen able-bodied subjects participated in two sessions. During the first session, subjects acclimatized to wearing the robot and learned how to minimize the contribution of the hip and knee motors by using their own muscle power. During the second session, we recorded muscle activity with electromyography at different leg muscles and joint angle data at the hip, knee, and ankle. Muscle amplitudes were greater (all \( P \leq 0.02 \)) while walking in the exoskeleton compared to normal walking. In addition, hip and knee range of motion data were greater (all \( P \leq 0.009 \)) while walking in the exoskeleton compared to normal walking, but ankle range of motion was less (all \( P \geq 0.02 \)). This suggests that exoskeleton controllers may need to be more flexible and allow more variability in their walking trajectories in order to provide a more task-specific learning environment for each individual. Lower limb exoskeletons may be one method to help increase walking function in those with neurological injury. Studies are needed to examine the effectiveness of currently available devices and to help inform best practices for their use.
507  Poster #28
**In-house validation of the Omron Automatic Blood Pressure Device**
Stephanie Coffin, Pre-Physical Therapy (U)
Lisa Hernandez, Physical Therapy

**Introduction:** Observations in our lab suggest that there may be differences in blood pressure when performing the gold standard of manual blood pressure (MBP) measurement or when using the Omron automatic blood pressure (ABP) monitor. Purpose: To compare the accuracy of the Omron ABP monitor vs. manual blood pressure measurement. Methods: Self-reported age, gender, height, and weight were recorded (see Table 1). Height and weight were used to calculate BMI. Two separate trials, Trial #1 and Trial #2, were conducted. Both trials required the participant to be seated five minutes prior to blood pressure (BP) measurement and to remain seated during assessments. BP measurements were spaced 2 minutes apart. In Trial #1, a MBP was taken first, followed by an ABP and then, a second MBP. In Trial #2 a MBP was taken first, followed by an ABP. This cycle was repeated again for a total of 2 MBP and 2 ABP measurements.

Data were analyzed in SPSS v.17.0 (Chicago, IL). Paired t-tests were conducted to compare group means. Results: There were no significant differences between MBP and ABP values in either trial. However, in Trial #1 ABP overestimated both systolic blood pressure (SBP) and diastolic blood pressure (DBP) on average by 0.4 mmHg ($p = 0.93$) and 2.1 mmHg ($p = 0.07$), respectively. In Trial #2, ABP underestimated SBP by 1.3 mmHg ($p =0.46$) and overestimated DBP by 2.1 mmHg ($p =0.12$) when compared to MBP measurements. Conclusion: Although the differences between MBP and ABP were not statistically significant, there is the potential to misclassify a patient in a clinical setting. For example, a patient may be classified as “pre-hypertensive” rather than “normal” when using an automatic BP monitor.

Table 1. Participant characteristics.

<table>
<thead>
<tr>
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<th>Trial #1 (N=11)</th>
<th>Trial #2 (N=18)</th>
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<td></td>
<td>26.6 ± 1.1</td>
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Trial #1 consisted of 6 male subjects (average BMI 26.8, SD±2.1) and 5 female subjects (average BMI 26.6, SD±1.1) with average age 42.5 years, SD±10.3. Trial #2 consisted of 9 males (average BMI 26.2, SD±3.3) and 9 females (average BMI 22.7, SD±3.3) with average age 36.9 years, SD±8.9.

508  Poster #29
**Imposed expiratory flow limitation, hyperinflation, and dyspnea are dissociated from locomotor fatigue during moderate exercise**
Brooke Wickman, Exercise Physiology & Nutritional Sciences (M)
Daniel Cannon, Exercise Physiology and Nutritional Sciences

During heavy exercise, expiratory flow limitation (e.g. asthma, chronic obstructive pulmonary disease) results in dyspnea, dynamic hyperinflation, and premature exercise intolerance. This cascade seems to be primarily precipitated by abnormal lung mechanics that result in exacerbated symptoms and reduced maximal evocable limb motor activity. We do not know whether this cascade behaves in the same way during moderate exercise where only modest locomotor fatigue is expected to develop.

We hypothesized that expiratory flow limitation would result in dynamic hyperinflation, dyspnea, and exacerbate locomotor fatigue during moderate exercise in a similar manner to that during heavy exercise.

Volunteers (N=10, 27±6 yr) completed constant power moderate exercise (50% peak ramp power) with 3 levels of imposed expiratory flow resistance (7, 9, 11 cm H$_2$O·L·s$^{-1}$) or control (no imposed flow limitation). We measured operating lung volumes during exercise with inspiratory capacity maneuvers and dyspnea and leg effort with a Borg 10-point scale. At the termination of exercise we used a rapid switch from hyperbolic to isokinetic cycling to measure the decline in peak isokinetic power ($P_{iso}$).

Decline in $P_{iso}$ was not different when expiratory flow limitation was imposed ($p >0.05$). Inspiratory capacity was lower vs. control at end exercise in the most severe flow limitation (11 cm H$_2$O·L·s$^{-1}$; 2.31±1.52 vs. 3.15±0.71 L; $p <0.05$). Similarly, inspiratory reserve volume was lower vs. control at end exercise in the most severe flow limitation (-0.07±1.28 vs. 0.82±0.43 L; $p <0.05$). Dyspnea was greater vs. control at end exercise in both mild and severe flow limitation (7 and 11 cm H$_2$O·L·s$^{-1}$; 5.7±2.5 and 5.2±1.9 vs. 3.7±1.6; $p <0.05$). $P_{iso}$ was not related to inspiratory reserve volume, inspiratory capacity, or dyspnea ($p >0.05$).

Imposed severe expiratory flow limitation results in hyperinflation and exacerbated dyspnea in healthy volunteers. Unlike what we have shown during heavy exercise, however, abnormal lung mechanics and dyspnea do not directly affect maximal locomotor power during moderate exercise.
509  Poster #30

Differences in movement of the lumbar spine and lower extremities between people with and without low back pain during a pick up task

Natalie D’Arpa, Physical Therapy (D)
Sara Gombatto, Physical Therapy

Purpose/Hypothesis: Lumbar spine movement during functional activities is important for the examination and treatment of people with low back pain (LBP). The purpose of this study was to compare 3D lumbar spine and lower extremity movement in people with and without LBP and among movement-based low back pain (LBP) subgroups during a pick up task. We hypothesized that people with LBP would display less lumbar and more hip flexion than people without LBP and that movement-based LBP subgroups would display predictable differences in hip and lower extremity movement. Methods: 35 people (14 M, 21 F, 26.9±10.9 years, 24.8±3.2 kg/m²); 17 with and 18 without LBP were matched based on age, gender and BMI. Movement of the lumbar spine and lower extremities were measured using a 3D motion capture system. People with LBP were examined by a physical therapist and assigned to movement-based LBP subgroups using the Movement System Impairment classification system. ANOVA tests were used to examine group differences in lumbar spine and lower extremity movement, within all three planes of motion, and to examine the effect of movement-based LBP subgroup on lumbar spine movement. Results: For the lumbar spine, people with LBP displayed greater upper and less lower lumbar flexion than controls (P<.05). Both groups displayed more lumbar spine flexion during the middle 50% of the task. For the lower extremity, people with LBP displayed more knee flexion and more off-plane hip and knee movement during the task. For LBP subgroups, people in the Rotation with Flexion subgroup displayed more upper lumbar lateral bending and people in the Rotation subgroup displayed more lower lumbar lateral bending than other subgroups. Conclusions: Group differences in movement between the upper and lower lumbar spine during functional tasks need to be considered when examining people with LBP and developing movement-based functional interventions. Greater lumbar flexion during the mid ranges of the task also suggests it is important to observe lumbar spine movement throughout all phases of a task rather than just at end range.

510  Poster #31

Postpartum Diastasis Recti Abdominis: Treatment and Functional Implications

Rose Schlaff, Physical Therapy (D)
Dr. Lori Tuttle, Physical Therapy

Background: Diastasis Recti Abdominis (DRA), a highly prevalent condition in which the rectus abdominis muscles separate at the midline or linea alba, affects 52% of women at eight weeks postpartum, and 39% of women at 6 months postpartum (Mota, 2015). Recent evidence suggests DRA may be linked to lumbopelvic and gynecological health problems in this population (Fernandes da mota 2015, Spitznagel 2006, Mota 2015). There is limited evidence describing effective non-invasive treatments for DRA in postpartum women. Purpose: To determine the most effective non-surgical, non-invasive physical therapy intervention for treating DRA in the postpartum population, with emphasis on exercise and abdominal binding, both of which have been shown to be effective in reducing Inter-recti distance (IRD) (Pascoal 2014, Benjamin 2014). IRD is defined as the distance between the left and right rectus abdominis muscles measured via ultrasound imaging. Design: This study will investigate the effect of three interventions (exercise, kinesiotaping, and exercise with kinesiotaping) on IRD compared to a control group. Subjects: 23 women have enrolled in the study and 17 have completed the final assessment. Of those 17, 5 were in the exercise group, 4 in the taping group, 3 in the combined intervention group, and 5 were control. Procedures: Our primary outcome is IRD measured via ultrasound imaging and each subject is in the study for 3 months. Subject time commitments are 1 pre-treatment visit, 1 visit for group assignment and training, 1 post-treatment visit, and weekly check-ins. Data are presented as means ± SD. Results: The control group IRD decreased by 0.46 cm ± 0.51. IRD of the taping group decreased by 0.19 ± 0.39, while the exercise group IRD decreased by 0.92cm ± 0.48. The exercise and taping group exhibited the most notable decrease in IRD with an average IRD difference of 1.39 cm ± 0.05. Conclusion: Based on our preliminary findings, combined exercise and taping is the most effective treatment for DRA, followed by exercise alone.
511 Poster #32
Prevalence of Impairments, Pain, and Symptom Change with Impairment Modification using a Movement System Impairment Examination for Low Back Pain
Grayson Arceo, Physical Therapy (D)
Sara Gombatto, Physical Therapy (D)
Purpose: Prevalence rates for low back pain (LBP) have been reported as high as 70 to 80% for individuals 20 years of age and older. Poor posture and movement abnormalities have been identified as contributing factors to the problem. The purposes of this study were to determine: (1) the prevalence of movement impairments, pain, and symptom change with correction of impairments in patients with LBP, and (2) differences in the number of direction-specific impairments among movement-based LBP subgroups. Methods: 25 subjects were examined using a standardized Movement System Impairment Examination. The examiner documented the presence and direction of movement impairment (rotation, flexion, extension), and recorded change in LBP during the test (increase, decrease, same). The examiner provided instruction to modify symptomatic tests and change in LBP symptoms with the modification was recorded (better, worse, no change). Patients were assigned to a movement-based LBP subgroup based on published guidelines. Results: More than 50% of subjects displayed impairments with 9/19 rotation tests. Tests commonly associated with painful rotation impairments were: seated knee extension, supine active hip and knee flexion, prone hip lateral rotation, and quadruped rocking back. More than 50% of subjects displayed impairments with 1/7 flexion tests. Standing forward bending elicited pain in nearly 50% of subjects with a flexion impairment. Prevalence of extension impairments did not exceed 50% for any test; 70% of subjects reported decreased pain with correction of 2/5 painful extension tests. 9 subjects were classified as Lumbar Rot, 13 as RotExt, and 2 as RotFlex. There were no significant differences among subgroups in number of impairments, painful impairments, and with modification for any direction (Ps=.06-0.57). However, Rot (2) and RotFlex (1.5) subgroups displayed more impairments and the RotExt subgroup displayed more ext impairments (2.3) than other subgroups. Conclusions: A high prevalence of rotation impairments and low prevalence of flexion and extension impairments was likely due to the higher number of rotation tests. There were small but predictable subgroup differences in number of flexion and extension impairments. Future study should examine the usefulness of balancing the number of direction-specific tests to determine if subgroups are more distinguishable.

512 Poster #33
Title: Differences in lumbar spine and lower extremity movement during a step down functional task in people with and people without chronic low back pain.
Alejandra Hernandez, Kinesiology (U)
Sara Gombatto, Physical Therapy (D)
Purpose: Information about differences in movement between people with and without low back pain (LBP) can help physical therapists develop more targeted movement-based interventions. The purpose of the current study was to examine differences in lumbar spine and lower extremity movement during a step-down task between people with and people without LBP. Methods: Thirty-eight subjects (16M, 22F), 29.0±13.6 years, were tested; 20 subjects were seeking physical therapy services for LBP, and 18 subjects had no history of LBP (CTRL). A 3D optical motion capture system was used to measure lumbar spine (upper, lower) and lower extremity (hip, knee) segment movement during 6 step-down trials; 3 trials with the left leg leading and 3 with the right leg leading. Total amount of movement of each segment, in each plane of motion, was calculated from the start to end of the task. Measures were averaged for the three trials, and because a preliminary analysis revealed no effect of lead leg side, data were averaged between right and left step down trials. Repeated measures ANOVA tests (α=0.05) were used to determine the effect of group (LBP, CTRL), and region (upper, lower; hip, knee), on sagittal, frontal and axial plane movement. Results: In the sagittal plane, people with LBP displayed less movement than people without LBP (P< 0.01). In the frontal plane, both groups displayed more upper than lower lumbar region movement (P<0.01). For the lower extremity, subjects with LBP displayed significantly more frontal and axial plane movement than CTRL subjects. Conclusion: Overall, people with LBP displayed less sagittal plane movement in the lumbar spine but more “off-plane” lower extremity movement than CTRL subjects during the step-down task. Greater “off-plane” movement in the lower extremities may be a compensation for lack of sagittal plane spine movement in people with LBP, in order to accomplish the step-down task. However, greater frontal and axial plane movement in the lower extremities may increase stresses at these joints and could result in secondary lower extremity impairment.
513  Poster #34

**Correlation Between Single Leg Balance and Functional Ability**

Tyler Voas, Athletic Training (U)
Tom Abdenour, Athletics

Functional testing has been shown in research as reliable and valid as related to prior lower extremity impairments. The crossover and triple hop test is a preferred method of evaluating functional ability. However, these individual tests must be interpreted with caution. This study revises these functional tests by combining them into a single test. The new test increases the number of hops from the three to eight and adds a distance aspect to the traditional crossover test. This new hybrid test challenges the participants not only in the sagittal plane (triple hop test) or frontal plane (crossover test) but in a simultaneous combination with the potential to include transverse plane movement. The benefit of this test is a more accurate functional test which mimics the true movements that an athlete performs in their sport. The second variable of this study is the centimeters of sway of a single leg balance analyzed by the Balance Tracking System (BTrackS). The aim of this study was to investigate the correlation of single leg static balance with the functional ability of the lower extremity. The single leg balance scores were compared to functional ability scores and time to identify if balance is an indicator for functional ability. If proven valid, the improved crossover hop test may establish valid identifiers for risk of future lower extremity injury in the pre-participation examination of athletes. This same test can then be normalized for return to play protocols in athletes who have sustained a lower extremity injury as compared to baseline data. Therefore, by expanding the functional testing capability and increasing the analytical ability of balance, a more efficient test can be used in establishing new operating procedures for Athletic Trainer’s and the care of patients.

514  Poster #35

**Postural control with concurrent cognitive tasks in postural instability gait disorder vs tremor dominant Parkinson’s disease patients**

Jyotika Erram, Athletic Training (U)
Harsimran Baweja, Physical Therapy

Dopaminergic denervation in the basal ganglia is responsible for reduced movement automaticity in patients with PD and increased reliance on attention to execute motor functions such as maintaining posture and balance. Postural control is very often accompanied with cognitive activities that are unrelated to posture and could impede postural corrections in PD patients. PD can be further classified as Postural instability/gait dominant (PIGD) and Tremor dominant (TD) phenotypes with PIGD variant being more susceptible to rapid cognitive decline when compared with TD. However, the effect of concurrent cognitive loads on postural corrections in PIGD and TD phenotypes of PD is not well understood. Therefore, the purpose of this study was to compare the effect of concurrent cognitive tasks on quiet unperturbed standing in PIGD and TD Parkinson’s disease patients. Data collection is ongoing. Currently, 8 PD-PIGD patients (age range: 64–84 years; 2 females), 13 PD-TD patients (age range: 62–84 years; 3 females) and 30 healthy controls (Age range: 60–90 years; 18 females) have taken part in the study. The Balance Tracking System (BTrackS, San Diego, CA) force plate was used to measure postural sway as an indicator of balance ability. Balance testing consisted of 2 conditions: Single-task with eyes open, and dual-task with eyes open and verbal memory encoding. Subjects performed 3 trials per condition while standing with feet shoulder width apart and hands on hips. Each trial lasted 20 seconds during which the total center of pressure (COP), antero-posterior COP, and medio-lateral COP sway displacements were calculated. A principle component analysis was used to calculate the 99% confidence interval of the area within which the COP excursions would lie. Additionally, subjects performed the verbal memory encoding task in sitting, while their balance was not being tested or challenged. The subjects’ error rates on the verbal memory encoding task were then calculated ‘on’ and ‘off’ the force plates. Our preliminary findings suggest that postural sway excursions are amplified in PD patients (PIGD>TD>HC). These differences are greatest in medio-lateral sway excursions especially during the dual-task. Our findings have significant implications for fall risk in PD patients.

515  Poster #36

**Comparing the efficacy of two methods of balance training on a narrow beam by using lower limb muscle coactivation as a predictor of learning**

Adam Schmaltz, Kinesiology (M)
Antoinette Domingo, Exercise and Nutritional Sciences

Identifying motor recruitment patterns during motor learning in individuals can lend insight into the muscular control strategies involved in learning difficult tasks. The purpose of this study was to compare muscle coactivation changes during two different conditions of practice when learning a difficult walking balance task (tandem walking on a 0.5-inch wide treadmill-mounted balance beam). One method, Simplification training, involves practicing an easier version of the task and then gradually increasing task difficulty. The other method, Task-Specific training, focuses on practicing the target task for the entire duration of the training. Coactivation of the stabilizing muscles was measured to determine if one of the two training modalities elicits a significantly greater motor learning outcome. Our
hypothesis is that Task-Specific training will result in greater decreases in muscle coactivation when learning how to walk on a narrow balance beam compared to gradually increasing task difficulty. Eight subjects performed 3-minute pre-training and post-training tests on the beam-mill. During the 30-minute training period, subjects in the Simplification group walked on a 1.5-inch wide beam, then a 1.0-inch beam, and lastly a 0.5-inch beam for 10 minutes each. Subjects in the Task-Specific group walked only on the 0.5-inch beam during training. EMG data was collected from the tibialis anterior, peroneus longus, medial gastrocnemius, and peroneus brevis muscles. EMG, kinematic, and force plate data for five subjects were analyzed using MATLAB analysis software. Preliminary data showed there was an increase in percent time spent on beam after training (Task-specific group mean increase=6.11s, while the Simplification group mean increase=3.26s) as well as a decrease in muscular coactivation for all groups indicated by a decrease in the average coactivation coefficients (simplification: PL/TA=9.2%, TA/MG=6.8%, and same task: PL/TA=13.7%, TA/MG=18.1%), suggesting that task acquisition was indeed inversely related to muscular coactivation.

516 Poster #37

Differences in Kinematics Between People With and Without Low Back Pain During a Functional Step-Up Task

Katie Mitchell, Physical Therapy (D)
Sara Gombatto, Physical Therapy

Low back pain (LBP) is an epidemic affecting more than one third of the population. Chronic LBP is responsible for increased medical costs, functional limitations and decreased quality of life. A clear etiology is rarely identified in patients with nonspecific LBP. Identifying abnormal movement patterns that may cause chronic LBP will inform a more effective physical therapy treatment protocol to reduce and prevent recurrence. The purpose of this study was to determine differences in lumbar spine movement in people with and without LBP during a functional step-up task. We hypothesize that people with LBP will demonstrate decreased overall lumbar motion during this task.

Thirty-seven subjects were recruited; 19 with recurrent LBP and 18 healthy subjects. A motion capture system was used to record joint movement during the step up task (9.5” step). Analysis of variance tests were used to compare three-dimensional motion of the upper and lower lumbar spine and lower extremities between the two groups.

Subjects with LBP displayed less lower lumbar movement in the sagittal plane than control subjects (P<.01). There are several potential explanations for this group difference. First, subjects with LBP may be moving less in this region to avoid pain. Another possibility is that the LBP group has degeneration in the lower lumbar segments, resulting in stiffening in this area. Finally, the LBP group may have inadequate activation of the spinal flexors during this task, resulting in less flexion of the lower lumbar spine. Further studies could examine these possible explanations. For the lower extremities, subjects with LBP displayed more frontal and transverse motion at the knee and greater transverse motion at the hip than control subjects (P< .01). One possible explanation for the increase in out-of-plane movement in the knee and hip is regional interdependence. This means that subjects with LBP may be compensating for a lack of motion at the lower lumbar spine with more motion at the hip and knee joints in order to accomplish the task. Compensatory out-of-plane motion at the hip and knee could explain the increased risk of secondary lower extremity injury in people with LBP.

Session C-16
Poster: Business
Friday, March 4, 2016, 12:30 – 2:00 pm
Montezuma Hall

517 Poster #38

Determination of Sustainability Preferences Among Craft Beer Consumers in San Diego County

Larina Cassidy, Recreation and Tourism Management (U)
Vinod Sasidharan, Hospitality and Tourism Management

With the emergence of larger numbers of eco conscious consumers in the last decade there is a push across multiple markets to create more sustainable products. In response to this trend many green initiatives have been implemented in the craft beer market (Kleban, 2012; EdibleSD, 2015). This study’s purpose is to examine whether craft beer consumers are influenced by the green efforts these companies are pursuing. Five factors were employed to examine whether there was a correlation between consumers’ willingness to pay, preference for a sustainable company, and willingness to learn about a sustainable company. The five factors were; sustainable visibility (Shih-Tse, 2014), belief in effectiveness of purchasing choice (Kim and Choi, 2005), sustainable awareness (Sarkar, 2012), previous eco-purchasing history (Dagher, 2015), and age (Beyrouti, 2014). A 65-question survey was administered via Ipad with the application QuickTap survey using random sampling at various craft beer locations throughout San Diego County. The survey was conducted between the months of December, 2015 and February, 2016. It was predicted that younger consumers, with high sustainable visibility in their social circles would be most likely to prefer a
sustainable craft beer company. However, willingness to pay for a sustainable craft beer company will be mostly correlated with higher levels of sustainability awareness. Findings from this study could lead to consumers becoming more educated on sustainability efforts of craft beer companies and possibly altering their purchasing habits to become more eco-friendly across other markets. Not only does this research have implications for craft beer consumer behaviors but also on craft beer companies themselves as they will have a better idea of where to increase sustainability efforts based on customer feedback. With increasing ‘green’ competitiveness within the craft beer industry having a sustainable edge could be the difference in keeping a company profitable. One limitation of this survey was that due to time restrictions, only a small portion of craft beer consumers could be surveyed. Further research should be conducted using a larger sample size to put sustainable marketing strategies in place that target a broader group of craft beer consumers.

518 Poster #39

Appropriate Gift Giving: A Comparison Between China and the United States
Vincent Bellengerhie, Communication (U)
Vinod Sasidha, Recreation and Tourism Management

This study examined appropriate gift giving rituals and behaviors in various relational contexts. Undergraduate students from SDSU (N=18) and Beijing (N=18) were interviewed about gift giving rituals, occasions of giving, experiences of guilt, cultural taboos, and relationships. The aim was to determine how gifts are effectively given in the two cultures to their bosses, friends, romantic partners, and parents. The results suggest that SDSU students open gifts immediately, whereas Beijing students open gifts in private. In addition, Beijing students obey cultural taboos in gift giving because of their parents, whereas SDSU students do not have cultural taboos in gift giving. Gift giving in different relationships varied between the two cultures. Despite the relationship or culture, the material gifts were only as valuable as their ability to communicate a message of care to the receiver.

519 Poster #40

The Societal Implications of the American Millennials’ Savings Plan
Gareth Lintt, Management (U)
Kangoh Lee, Economics

This study examined the saving strategies of the Millennial generation and the huge implications those tendencies will have on society as a whole. Nearly a quarter of the nation’s population is made up of Millennials, and in less than two years, the entire generation will be over the age of eighteen. As the largest living generation, their spending habits have potentially the greatest influence on the economy and market fluctuation. By looking at the variables that correlate positively with a strong savings mindset, the study strives to show the implications of their current financial decisions.

Through the utilization of the online platform called SurveyMonkey, an electronic survey was created and distributed through social media. With the collection of 200 convenience samples, we have gathered data regarding Millennials’ saving practices using potential contributing factors such as: gender, race, expected retirement age, health, credit scores, debt, parental income, employment status, marital status, and level of education. These factors will be computed using regression analysis to determine a correlation between saving money and personal attributes.

This research could help us understand, and potentially avoid, future financial catastrophes such as the real estate bubble burst experienced during the Great Recession. For instance, the findings regarding disparities in personal savings rates between gender, owning property and marital status may suggest that single males are more likely to save money than married males. The study could predict the effectiveness of social programs such as the Affordable Care Act due to the propensity of individuals to save more when they receive regular check-ups. The positive externalities associated with monetary savings could influence future legislation and have a dramatic effect on societal perception of the financial services industry.

520 Poster #41

Starbucks
Nicholas Robbin, Marketing (U)
Iana Castro, Marketing

Starbucks, one of the renowned retailers in the world, has been at the forefront of the coffee industry since opening its doors in 1971. Even today, Starbucks continues to dominate the market as this past July they posted the highest grossing single quarter in company history (4.9 billion). However, the purpose of our project was to not only discover what has made Starbucks so successful, but to determine areas in which Starbucks could further improve their operations.

Our methods to obtaining information on our company mainly came from two sources: Internet research and in-store observational research. First, our group began by reviewing the Starbucks website to gain a basic overview of the company. However, a company’s website does not highlight pitfalls or areas that could be better utilized. Our next step involved surfing the web for annual reports, relative news articles, and anything that concerned the past, present, or future of Starbucks. Finally, after gathering enough knowledge on Starbucks, we assessed a local Starbucks where we sat down with the store manager.
Our results showed that Starbucks, despite fierce competition, is still the superpower of American coffee. This statement is supported by the fact that Starbucks claims 32.8% of the US market share in the coffee industry. Starbucks was built on offering high quality coffee and other related products, while providing customers with that special “Starbucks Experience.” This unique experience is derived from a combination of exceptional customer service complemented by their friendly open atmosphere. Despite their strong hold on the industry, competitors, such as McDonald’s and Panera, are knocking on the door. McDonald’s, equipped with drive thrus at all location, provide customers with better accessibility to coffee at a cheaper price. Panera, on the other hand, offers a wider menu selection, which appeals to every meal of the day.

In conclusion, Starbucks should focus on development in emerging markets, expansion of product mix and offerings, retail operations, and advancement in technological advances. By improving in these areas Starbucks will continue its reign as the superpower of the coffee industry.

521 Poster #42
Bikeshare and Transit in National City, CA: Implications for Climate Change, the Economy, and Public Policy
Jeremy McKinstry, Environmental Health Sciences (M)
Richard Gersberg, Public Health

Climate change is an emerging problem that is already having widespread impacts with global implications, but that must be addressed on a community scale. Since 2002, California has passed much legislation aimed at mitigating the effects of climate change. This has prompted many communities throughout the state to begin creating greenhouse gas (GHG) emission inventories and adopting climate action plans (CAPs) to meet statewide regulations. National City is one of these communities, but their current CAP (adopted in 2011) falls short of the recently passed Executive Order B-30-15, which sets a California GHG emission reduction target of 40% below 1990 levels by 2030. This translates to the need for National City to develop and implement additional GHG emission reduction strategies to meet the statewide mandate.

65% of the emissions in National City are attributable to transportation. This research seeks to address this problem through 3 main objectives. First, predicting the emission reductions from the implementation of a bikeshare system by applying differentiating factors to 2011–2014 ridership trends from Colorado’s Boulder B-Cycle. Second, examining the relationship between San Diego Trolley ridership and the recent implementation of several DecoBike stations in the vicinity of trolley stops in downtown San Diego through the use of GIS spatial analyses and application of the General Linear Model. And finally, the relationship between trolley ridership and fuel prices in San Diego County from 1995 through 2014 will be determined through the use of cross-elasticities to develop a statistical formula that controls for both recession and inflation.

2017–2020 GHG emission reductions from bikeshare system implementation in National City were found to be minimal (13–25 MTCO2e/year). However, they could provide much more significant emission reductions in the future, especially given the rapid expansion of bikeshare systems in the past 15 years. This research will also attempt to answer several questions including the use of a bikeshare system as a “last mile” strategy and the effect of a gasoline or vehicle miles traveled tax. I aim to find transportation-centered solutions that can not only be adopted in National City, but also in other communities in California and the nation.

Session C-17
Poster: Hispanic Health Issues
Friday, March 4, 2016, 12:30 – 2:00 pm
Montezuma Hall

522 Poster #43
Neighborhood Income and Anxiety and Depression Symptoms among Hispanic Americans
Grecia Sanchez, Psychology (U)
Elizabeth Klonoff, Psychology

Income inequality between Whites and Hispanic Americans (HAs) has grown over the past decade, with White households currently having more than ten times the income of HA households. Socioeconomic status, which often is measured via an individual’s income, has been shown to be one of the strongest predictors of health, and has been inversely associated with mental health. More recently, researchers have focused on the impact of neighborhood income, as opposed to individual income, on health, and the association between neighborhood income and mental health has been less consistent. Neighborhood income is an important factor to assess because of its focus on the broader contextual experiences of one’s daily life. For example, neighborhood income may have a relationship with many factors that impact mental health such as access to health care, healthy foods, and neighborhood walkability. Thus, the present study explored the relationship of neighborhood income to anxiety and depression symptoms among a community sample of self-identified HA men and women (N = 383). Participants completed the Generalized Anxiety Disorder-2 (GAD-2) and Patient Health Questionnaire-2 (PHQ-2) scales, screeners of anxiety and depression symptoms, respectively, and provided their home
address. Neighborhood was defined by residence in a census tract, and neighborhood median income data were gathered from the US Census database. Multi-level modeling was used to examine the relationship between neighborhood median income and GAD-2 and PHQ-2 scores. Neighborhood median income was significantly, negatively associated with anxiety ($b = -.002$, $p < .01$) and depression ($b = -.001$, $p < .01$) symptoms. In sum, lower neighborhood income was associated with more anxiety and depression symptoms in HA men and women. These findings suggest that HAs living in lower income neighborhoods may be at higher risk for experiencing anxiety and depression symptoms. These findings are consistent with the literature that shows a relationship between neighborhood deprivation and mental health. The study results have clinical, social, and public policy implications. Future studies should examine the mechanisms by which neighborhood income is associated with anxiety and depression in the interest of effectively preventing and treating mental health problems in the HA community.

523 Poster #44

*Neighborhood Income and Health-Related Quality of Life in Hispanic Americans*

Jose Valdez, Psychology (U)
Vanessa Malcarne, Psychology

Neighborhood income, an environmental variable representing a community’s socioeconomic status, has been associated with health behaviors and outcomes, including health-related quality of life. This may be because neighborhood income is associated with several factors that impact health, such as health care access, availability of healthy foods, and access to open space. Neighborhood income may be a better indicator of the broader context within which an individual lives as compared to individual income. Studies have shown that Hispanic Americans (HAs) report worse health-related quality of life in comparison to non-Hispanic Whites, but no studies have specifically examined the relationship of neighborhood income to health-related quality of life in HAs. The present study explored the relationship of neighborhood income to mental and physical health-related quality of life among a community sample of HAs. Self-identified HA men and women ($N = 383$) provided their home address and completed the Short Form Health Survey-12 (SF-12), a measure of mental and physical health-related quality of life. Neighborhood was defined by residence in a census tract, and neighborhood median income data were gathered from the US Census database. Multi-level modeling was used to examine the relationship between neighborhood median income and SF-12 scores. Neighborhood median income was significantly positively associated with mental health-related quality of life ($b = .008$, $p < .01$), but not significantly associated with physical health-related quality of life ($b = .004$, $p = .07$). In sum, greater neighborhood income was associated with better mental health-related quality of life in a community sample of HA men and women. These findings suggest that HA men and women living in low-income neighborhoods may be at higher risk for experiencing poor mental health-related quality of life. Future studies should examine what particular aspects of one’s neighborhood impact mental health-related quality of life in HAs.

524 Poster #45

*Willingness to Use Hospice Care Among Caregivers of Rural Latino Patients*

Stephanie Martinez, Social Work (M)
Eunjeong Ko, Social Work

**Background:** Hospice is an important mechanism to quality end-of-life (EOL) care. Despite the increasing number of patients using hospice services, only 7.1% of hospice patients are Hispanic or Latino. Family plays an important role in EOL decision making among Latinos, yet little is known about family’s preference for hospice care for their loved ones. **Purpose:** The purpose of this study is to 1) explore caregivers’ willingness to use hospice care and 2) its association with socio-demographic and culture related variables. **Design and Sampling**

**Method:** This was a secondary data analysis of existing data from a local home health agency in El Centro, California. Convenience sampling method was used to recruit 210 caregivers of the enrolled patients at the study site. Participants’ eligibility criteria included being at least 18 years or older and a primary caregiver. **Results:** The majority of caregivers were female (77.1%), and most patients were Latino (90.9%). The majority of caregivers (84.2%) were willing to use hospice care but only 27% were familiar with hospice. Bivariate analysis results indicated that prior hospice use experience ($p = .004$), belief about receiving hospice means giving up on living ($p = .026$) and language ($p = .007$) were significantly associated with caregivers’ willingness to use hospice care for their loved ones. Participants who had a previous experience with hospice and those who were interviewed in English had a greater preference for hospice use. Conversely, participants who believed that receiving hospice care means giving up on living were less likely to prefer hospice care. **Conclusion:** Assessing caregivers’ cultural beliefs and knowledge about hospice care is necessary to ensure a culturally competent practice. Community-based education about hospice is recommended.
525  Poster #46
Change in depressive symptoms and food behaviors for Mexican American women participating in a culturally-tailed diabetes prevention pilot intervention
Kinsey Pebley, Psychology (M)
Linda Gallo, Psychology

U.S. Hispanics experience marked disparities in many areas of health, including obesity, type 2 diabetes, and mental health care access. Compared to non-Hispanic Whites, they are 15% and 65% more likely to be overweight/obese and have diabetes, respectively. Furthermore, only 36% of Hispanic individuals with depression receive treatment versus 60% of non-Hispanic Whites. Research suggests depression is related to dietary quality and poor nutrition may play a role in onset and severity of depression. Thus, interventions targeting nutrition may have the potential to positively impact mental health in Hispanics. The objectives of the current study were to explore the relationship between dietary quality and depressive symptoms in midlife Hispanic women at risk for diabetes, and to evaluate changes in these variables after participation in a culturally-tailed diabetes prevention program. Nuestra Vida was a 12-week, promotora-led lifestyle intervention that targeted physical activity, dietary intake, and management of negative emotions (e.g., depression, stress). Participants were women aged 45–65 years with body mass index (BMI) ≥ 25 who did not have diabetes. Depressive symptoms, dietary quality (e.g., consumption of fruits, vegetables, sodas, foods high in fat), and demographic variables were assessed at baseline, 3 months (post-intervention), and 6 months. 25 women completed all assessments. Mean age was 55.4 years (SD = 4.79), 44% had a high school education or less, and 68% had a household income < $40,000. 80% were born in Mexico; mean time in the US was 31.85 years (SD = 10.06). A statistically significant inverse association was found between higher depressive symptoms and lower dietary quality (r = -.423, p = .039). Compared to baseline scores, depressive symptoms were significantly lower (less depression) at month 3 (t = 5.09, p < .0001, mean difference = 1.68) and month 6 (t = 2.74, p = .012, mean difference = .92). Dietary quality was significantly higher at month 3 (t = -4.5, p < .0001, mean difference = -3.792) and month 6 (t = -3.75, p = .001, mean difference = -3.54). Improvements were seen in both depressive symptoms and dietary quality at termination of the intervention, with a slight decrease in effect at 6 months. Results suggest that a culturally-tailed diabetes prevention program is an effective strategy for improving dietary quality and depressive symptoms.

526  Poster #47
Perceived Community-Level Violence and STI Prevalence among Mexican Female Sex Workers Who Inject Drugs
Nathan Alamillo, Public Health (D)
Susan Kiene, Graduate School of Public Health

Background: HIV prevalence in Mexico is low (0.3%), but markedly higher among female sex workers (FSWs) (8%), female injection drug users (IDUs) (10%), and FSW-IDUs (12%) in Tijuana, Baja California and Ciudad Juarez, Chihuahua. To date, little is known about the effects of Mexico’s drug war on HIV-related health outcomes. We describe associations between perceptions of community-level violence and prevalence of sexually transmitted infections (STIs) among FSW-IDUs in these border cities. Methods: FSW-IDU aged 18 and older who tested negative for HIV and reported having unprotected sex and sharing injection paraphernalia with clients in the last month participated in a behavioral intervention in these cities. Participants completed a questionnaire at baseline and were tested for HIV, syphilis, gonorrhea, and chlamydia. Using the baseline data, we used generalized linear modeling with a logit link to examine if community-level factors were associated with testing positive for any STI. Results: Of 584 women, median age was 33 years, 32.9% had at least one STI, and 71.9% injected heroin. In univariate models, perceiving an increase in street violence (unadjOR: 1.73; 95% CI: 1.21–2.46), federal army presence (unadjOR: 1.78; 95% CI: 1.22–2.59), and visibility of mafia/drug cartels (unadjOR: 1.55; 95% CI: 1.08–2.23) was associated with higher STI prevalence, but only street violence (adjOR: 1.83; 95% CI: 1.07–3.15) remained significant in the preliminary multivariate model. Conclusion: Community-level factors related to violence and security may be important risk factors for STI acquisition and should be further examined with prospective analyses to investigate mechanisms underlying these relationships.

176  Poster #48
Capacitance in Capillary Electrophoresis
Adam Perez, Chemistry (U)
Christian Harrison, Chemistry

Capillary electrophoresis has many advantages as a system for quantifying analytes, and exploring its functionality with a contactless capacitance detector will expand its utility in medical analyses. Conventional detectors, such as UV absorbance and laser induced fluorescence are limited in their versatility. Analyzing samples through UV requires the analyte to be able to absorb a certain wavelength to be measured. If the samples have a different range of wavelengths, an expensive UV absorbance detector with variable set wavelengths is required. LIF detection requires the addition of fluorophore which changes the chemistry of the compound and limits the samples that can be analyzed.

STUDENT RESEARCH SYMPOSIUM 2016
Conversely, a capacitance detector allows for sensitive detection of any sample as it passes through a capillary during electrophoresis. As analytes pass through the detector, a change in capacitance, specifically the solution’s ability to hold a change between electrodes, is measured through the AD7745 program. The dual capacitance detectors rely on one as a reference electrode while the other subtracts the signal, making the system effective for detecting peaks without having to account for the conductivity of the buffer. The goal of the research is to create a system that fully optimizes the process for detecting capacitance through capillary electrophoresis. With an effective universal detector, its applications range from identifying ions to quantifying viruses.

**Session D: Poster Presentations**

**Session D-9**

**Poster: Medical Biotechnology**

Friday, March 4, 2016, 2:15 – 3:45 pm

Montezuma Hall

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**527  Poster #1**

*Developing a Dengue Virus-based Assay for the Identification of Novel Inhibitors*

Juan Gadd, Biology (U)  Roland Wolkomicz, Biology

Dengue Virus (DenV), considered an emerging viral pathogen in the US, is the causative agent for Dengue Fever, Dengue Hemorrhagic Fever, and Dengue Shock Syndrome. Currently, there is no vaccine against DenV highlighting the need for research efforts studying this complex virus. A member of the *Flaviviridae* family, DenV is a positive sense, single-stranded RNA virus that upon entry into the host is translated into a single polyprotein. This polyprotein immediately embeds itself in the Endoplasmic Reticulum (ER) where it weaves in the membrane and is post-translationally processed by both host and viral proteases. Thus, inhibiting the activities of the viral protease presents a novel and attractive target for the search of antivirals.

In our lab we are experts in cell-based assay development for monitoring viral protease activity. In this assay, we use the ability of DenV proteins to anchor to the ER membrane as a means to monitor processing events by the viral protease. The viral Non Structural 2B (NS2B) protein contains several domains that allow it to embed itself in the ER which we exploit to localize the assay. In order to monitor cleavage events that take place here, we use the catalytic domain of the viral protease NS3, both active (wild type) and inactive (mutant), fused naturally to the NS2B protein, which is also a cofactor to the NS3 protease. Finally, we use the yeast transcription factor Gal4 fused to this construct by the substrate of the viral protease to detect activity. So far, we have used constructs that only use the NS2B protein as an anchoring domain, but recently we have begun exploring other possible anchoring domains with a new construct that uses a larger section of the virus. By doing this, we can study the protease and its relation to the other proteins of DenV in a natural course of virus maturation.

Once the assay is finished it can be used to screen available chemical libraries against the protease to find novel inhibitors. Additionally, the assay can also be adapted to other viruses, such as Hepatitis C Virus.

**528  Poster #2**

*A turning point for cancer: uncovering the differences in the behavior of the tumorigenic mutant IDH1 enzyme*

Stacy Anselmo, Biochemistry (U)  Christal Sohl, Chemistry

Tumorigenesis can be triggered by many effects, such as the mutation of human isocitrate dehydrogenase one (IDH1), a vital metabolic enzyme. Specifically, it catalyzes the decarboxylation of isocitrate into alpha-ketoglutarate (α-KG), an important metabolite and cosubstrate. It has been found that an important factor in the onset of cancer is associated with mutations in the IDH1 enzyme, particularly R132H and a less common mutation, H133Q. When the R132H mutation is present, it alters the structure of the enzyme at the IDH1 active site causing the enzyme to lose the ability to convert isocitrate into alpha-ketoglutarate. Therefore, the mutant structure catalyzes the conversion of α-KG into 2-hydroxyglutarate (2HG). The production of 2HG stops other enzymes dependent on α-KG from functioning, inducing a hypermethylated state of both histones and DNA causing a change in gene expression, potentially activating oncogenesis and inactivating tumor suppressors. To understand the effects of the mutated IDH enzymes that contribute to oncogenesis, we must first understand the structural features and catalytic pathways of the wild-type IDH.

It has not been tested if the amount of substrate available, isocitrate or NADP, will affect tumorigenesis. Thus, it is the goal of this research to shed more light on the inner workings of the wild-type IDH enzyme by utilizing steady state and pre-steady state kinetics while varying the levels of substrates provided. These studies can eventually produce tools for identification, drug development, and therapy against gliomas and leukemias.
Using Protein Design to Engineer the Cif Epoxide Hydrolase Enzyme for Neutralization of Mycotoxins

Courtney Scholl, Biology (U)
John Love, Chemistry

Protein Design is a technique used to engineer proteins with new and potentially enhanced functional properties. Proteins are designed by making judicious changes to the amino acid sequence, which can lead to changes in the protein structure and thus function. The goal of our research is to re-engineer the active site of an epoxide hydrolase that will then be used to detoxify genotoxic compounds. A toxin that we are targeting for degradation with the engineered epoxide hydrolase is the compound Deoxynivalenol, also known as vomitoxin. Vomitoxin belongs to a family of mycotoxins called trichothecenes, many of which are produced by the fungal genus Fusarium. Exposure to vomitoxin can constitute a serious economic and health concern (hence its name). Thus far we have employed standard laboratory techniques, such as recombinant DNA technology, to clone a Cif epoxidase gene from Pseudomonas aeruginosa. We are now sub-cloning this gene into standard bacterial expression vectors and also into a recently engineered bacterial display system. This system incorporates the red fluorescent protein mCherry, and a number of strong structural linkers, which enables the display of proteins on the surface of E. coli. We are using this tool to re-engineer and assess the effectiveness of the modified Cif epoxidase enzyme. The goal of this process is to ultimately generate a new enzyme that will be used to catalytically breakdown and thus neutralize the effects of vomitoxin. We hope that our findings will demonstrate the utility of protein design, in combination with the bacterial display system, to engineer novel enzymes that can be used to safely degrade toxic compounds such as Deoxynivalenol (vomitoxin).

A High Throughput Approach to Drug Discovery for the Treatment of Multiple Sclerosis

Katharine Moore, Biology (U)
Ralph Feuer, Biology

Multiple sclerosis (MS) is a chronic autoimmune disease characterized by degeneration of the myelin sheath and loss of oligodendrocytes, the myelinating cell type in the central nervous system (CNS). Current FDA-approved therapies for MS address only the immune component of the disease, and the majority of patients progress to a stage of accumulating disability despite treatment. Oligodendrocyte progenitor cells (OPCs) are a type of stem cell in the CNS with the ability to differentiate to oligodendrocytes. However, in patients with MS, OPCs fail to differentiate and do not remyelinate damaged axons, leading to a number of debilitating neurological deficits. Thus, there is an unmet clinical need for a therapeutic strategy that addresses progressive demyelination by increasing the number of myelin-competent oligodendrocytes in the CNS. The goal of this project is to identify drug-like small molecules that selectively induce differentiation of OPCs to mature, myelinating oligodendrocytes. To that end, we have utilized a high content imaging-based phenotypic assay to screen a collection of 80,000 novel and structurally diverse compounds. Increased levels of myelin basic protein (MBP), a main component of the myelin sheath, were used as a surrogate marker for differentiation in cultured primary rat optic nerve-derived OPCs. Our primary screen produced a hit rate of .42% and secondary screening to validate potential hits is currently underway. Confirmed hits will be used in an in vitro co-culture assay to demonstrate bona fide myelination of neurons. Cumulatively, these results will serve as a starting point for drug design while providing new biological targets for treating MS.

A Novel Screening Platform to Identify Drugs which Reprogram Pancreatic Cancer

Nicholas Villarino, Biology (U)
Kelly Doran, Biology

Pancreatic Ductal Adenocarcinoma (PDA) is the 4th leading cause of cancer in the US and has a predominantly lethal prognosis. Unlike most other cancers, patient lifespan post-PDA diagnosis has not changed in over 50 years, emphasizing the need for a breakthrough in therapeutic research. PDA originates in acinar cells, which secrete proteolytic digestive enzymes into the duodenum. In response to oncogenic Kras, these cells undergo acinar to ductal metaplasia and become highly proliferative. Indeed, we showed that overexpression of the bHLH protein E47 helix (bHLH) transcription factors declines as PDA progresses, suggesting a role for bHLH proteins in pancreas homeostasis. Among the hits we identified the statin class of drugs as significant inducers of bHLH activity and thus function. The goal of our research is to re-engineer sequence, which can lead to changes in the protein structure and thus promote myelination of neurons. To that end, we have utilized a high content imaging-based phenotypic assay to screen a collection of 80,000 novel and structurally diverse compounds. Increased levels of myelin basic protein (MBP), a main component of the myelin sheath, were used as a surrogate marker for differentiation in cultured primary rat optic nerve-derived OPCs. Our primary screen produced a hit rate of .42% and secondary screening to validate potential hits is currently underway. Confirmed hits will be used in an in vitro co-culture assay to demonstrate bona fide myelination of neurons. Cumulatively, these results will serve as a starting point for drug design while providing new biological targets for treating MS.

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532 Poster #6
Creating novel, patient-specific, stem cell therapies for Hemophilia B via CRISPR/Cas9 gene correction
Kevin Green, Biology (U)
Ralph Feuer, Biology

Hemophilia B is a rare, X-linked genetic disorder, affecting an estimated 20,000 individuals in the US and is caused by a defect in a clotting protein, Factor IX (FIX). This defect in FIX function, caused by mutation in the FIX gene, leads to excessive bleeding, internal hemorrhages and joint arthropathies. Current therapies are transient and fraught with issues: increased risk of blood-borne infections, high costs, limited availability, and short half-life of the administered proteins. This project aims to correct FIX deficiency by creating a stem cell based therapy utilizing patient-specific induced pluripotent stem cells (iPSCs) and CRIPSR/Cas9 gene editing technologies for treatment for Hemophilia B. My main focus of the project will be to implement a gene correction designed to circumvent patient-specific sequencing and to develop a CRISPR/Cas9 based method of correction that can be used universally for all patients to restore levels of functional FIX. We propose to do this by knocking-in a functional copy of the FIX cDNA downstream of the endogenous promoter but upstream of the translation start site. This way, irrespective of where a mutation is present in the coding region, a fully functional FIX protein will be produced under its endogenous promoter. Currently, we have initiated the screen by nucleofecting the donor DNA along with the Cas9 and the targeting guides into iPSC lines from a patient. After a PCR based screen, we have identified a number of putative corrected clones for further testing and characterization. These if corrected, will be directionally differentiated into hepatocytes through an optimized differentiation protocol for both in vitro and in vivo efficacy studies with the eventual goal of creating a safe, inexpensive, and permanent treatment for Hemophilia B.

533 Poster #7
The relationship between cigarette smoking and self-reported perceived health among current daily smokers.
Dan Frumer, Sociology (M)
Audrey Beck, Sociology

Although most literature finds the association between cigarette smoking and self-reported health (SRH) to be negative, fewer studies have examined this association among current daily smokers only, and whether the association is linear or not. This study examines whether smoking exhibits a linear or nonlinear association with SRH among current smokers only. It asks whether there is a threshold at which smoking has an appreciably greater negative association with SRH. To answer whether the number of cigarettes smoked per day by a current daily smoker is associated with one's SRH, this study utilized the 2014 NHIS (The National Health Interview Survey) and OLS regression. It was found that there were no differences in SRH among those that smoked less than 16 cigarettes per day, but those that smoked 16 or more had significantly worse SRH. It was also found that smokers’ feelings of anxiety had a negative effect on SRH but did not explain the association between smoking and SRH. Plainly, the more a daily smoker is worried in his/her everyday life, his/her self-rated perceived health score is poorer, regardless of how many cigarettes smoked per day. This study suggests that smoking more cigarettes, rather than less, doesn’t necessarily result in lower SRH until a certain threshold is met. Further research should examine whether these associations explain patterns of smoking cessation.

534 Poster #8
Sensitive Laser-Based Detection of Nicotine and its Metabolites for Second- and Third-Hand Smoke Studies
Filippo Venturini, Chemistry (M)
William Tong, Chemistry

Ultrasensitive detection methods for nicotine and its major metabolites are needed in order to reliably study first-, second- and third-hand smoke effects on children. We demonstrate laser wave-mixing spectroscopic methods as sensitive, portable and compact detectors suitable for field use. Reliable detection of nicotine is essential to track and understand numerous health and psychological effects caused by first-, second- and possible third-hand smoking. Our preliminary results indicate that nicotine and cotinine can be detected and separated in their native forms.
ABSTRACTS

STUDENT RESEARCH SYMPOSIUM 2016

Student Level: (U)=Undergraduate; (M)=Masters; (D)=Doctoral

pictures were associated with greatest positivity from the light drinking group, consistent with theta involvement in remembered pictures as compared to forgotten pictures only. During recognition emotional pictures were remembered and positive pictures, with the smallest positivity to neutral positivity within 400–700ms time window, followed by negative ERP analysis indicated that erotic pictures elicited the greatest difference in theta power between all emotional and neutral elicited the greatest theta oscillations (4–7Hz) overall, but the of emotional valence. During the rating task, erotic pictures of emotional pictures and its association with subsequent emotion-related enhancement of retrieval as a function of binge drinking. Forty three young, healthy individuals (age = 23.6 ± 3.5 yrs) participated in both sessions of the study. Twenty three participants reported drinking heavily with 11.66 ± 7.74 binging episodes and 4.43 ± 3.1 blackouts in the last 6 months and twenty participants were light social drinkers. The binge drinking group reported higher depression and impulsivity than the light drinking group. In the first session participants rated valence of unpleasant, neutral, pleasant, and erotic pictures from the International Affective Picture System (Lang, 2008). An unexpected recognition task was administered 48 hours later. Scalp EEG was recorded from 64 channels and analyzed in time-domain as event-related potentials (ERPs) and in time-frequency domain with Morlet wavelets. Both groups gave expected ratings of emotional valence. During the rating task, erotic pictures elicited the greatest theta oscillations (4–7Hz) overall, but the difference in theta power between all emotional and neutral pictures was particularly apparent in the light drinking group. ERP analysis indicated that erotic pictures elicited the greatest positivity within 400–700ms time window, followed by negative and positive pictures, with the smallest positivity to neutral pictures. During recognition emotional pictures were remembered better than neutral pictures. Greater theta was evoked by the remembered pictures as compared to forgotten pictures only for the light drinking group, consistent with theta involvement in memory processes. ERP analysis suggested that remembered pictures were associated with greatest positivity from 500–700ms only for emotional but not neutral pictures in both groups. The findings indicate that binge drinking is associated with reduced processing of emotional information and impaired memory retrieval. Even though behavioral measures did not differ between the groups, theta oscillations were particularly sensitive to these effects in concordance with the theories suggesting that it is an index of memory retrieval.

535  Poster #9

**Binge Drinking Is Associated with Reduced Brain Indices of Emotional Processing and Memory Retrieval**

Siyuan Huang, Psychology (M)
Ksenija Marinkovic, Psychology

There is a considerable amount of research showing dampening effects of excessive drinking on emotional processing but few studies have addressed this topic in individuals with a history of binge drinking. The present study examined the processing of emotional pictures and its association with subsequent emotion-related enhancement of retrieval as a function of binge drinking. Forty three young, healthy individuals (age = 23.6 ± 3.5 yrs) participated in both sessions of the study. Twenty three participants reported drinking heavily with 11.66 ± 7.74 binging episodes and 4.43 ± 3.1 blackouts in the last 6 months and twenty participants were light social drinkers. The binge drinking group reported higher depression and impulsivity than the light drinking group. In the first session participants rated valence of unpleasant, neutral, pleasant, and erotic pictures from the International Affective Picture System (Lang, 2008). An unexpected recognition task was administered 48 hours later. Scalp EEG was recorded from 64 channels and analyzed in time-domain as event-related potentials (ERPs) and in time-frequency domain with Morlet wavelets. Both groups gave expected ratings of emotional valence. During the rating task, erotic pictures elicited the greatest theta oscillations (4–7Hz) overall, but the difference in theta power between all emotional and neutral pictures was particularly apparent in the light drinking group. ERP analysis indicated that erotic pictures elicited the greatest positivity within 400–700ms time window, followed by negative and positive pictures, with the smallest positivity to neutral pictures. During recognition emotional pictures were remembered better than neutral pictures. Greater theta was evoked by the remembered pictures as compared to forgotten pictures only for the light drinking group, consistent with theta involvement in memory processes. ERP analysis suggested that remembered pictures were associated with greatest positivity from 500–700ms only for emotional but not neutral pictures in both groups. The findings indicate that binge drinking is associated with reduced processing of emotional information and impaired memory retrieval. Even though behavioral measures did not differ between the groups, theta oscillations were particularly sensitive to these effects in concordance with the theories suggesting that it is an index of memory retrieval.

536  Poster #10

**Prenatal Alcohol Exposure is Associated with Impairments in Executive Function**

Meaghan O’Brien, Psychology (U)
Sarah Mattson, Psychology

Background: Previous studies have indicated that children prenatally exposed to alcohol display deficits in executive function (EF). Other studies have found that the pattern of EF impairment differs between children with prenatal alcohol exposure and non-exposed children with attention-deficit/hyperactivity disorder. The current study aimed to extend these findings by comparing EF ability between children with prenatal alcohol exposure, typically developing controls, and a heterogeneous group of non-exposed children with a wide range of clinical behavior conditions. Method: 137 children (10–16y; M =13.4) were tested for the current study and placed into one of three groups: children with prenatal alcohol exposure (AE; n =43), non-exposed children with clinical behavior conditions (BCON; n =52), and typically developing controls (TCON; n =42). Subjects completed the 20 Questions subtest from the Delis- Kaplan Executive Function System (D-KEFS). Total Initial Abstraction and Total Weighted Achievement Scaled Scores were compared between AE, BCON, and TCON groups using between subjects ANOVAs. Significant effects within the ANOVAs were followed up with pairwise comparisons. Results: There was a significant main effect of group for both Total Initial Abstraction $F(2,132) =10.469; \ p <.001$ and Total Weighted Achievement Scaled Scores $F(2,132) =9.470; \ p <.001$. Follow-up pairwise comparisons indicated that the AE group had significantly lower Total Initial Abstraction and Total Weighted Achievement Scaled Scores compared to the BCON and TCON groups ($ps \leq .015$). In addition, Total Initial Abstraction Scaled Scores in the BCON group were marginally lower than the TCON group ($p =.055$), although these groups did not differ on Total Weighted Achievement Scaled Scores ($p =.270$). Conclusion: Results indicate that children prenatally exposed to alcohol score lower on measures of EF compared to non-exposed children with clinical behavior conditions and typically developing controls. These findings suggest that measures of EF could contribute to differential diagnosis between exposed and non-exposed groups. Further exploration of these deficits could refine the neurobehavioral profile of prenatal alcohol exposure to inform identification and intervention efforts.
Neural oscillatory dynamics underlying response inhibition is affected by binge drinking
Lee Holcomb, Psychology (U)
Ksenija Marinkovic, Psychology

Alcohol consumption in young adults is often characterized by binge drinking, which refers to heavy consumption on a single occasion, and has been shown to cause a multitude of health risks and social problems. The ability to withhold or suppress pre-potent actions is known as response inhibition and is an important component of executive functions. Previous evidence indicates that response inhibition is affected by long-term alcohol abuse and acute intoxication. Furthermore, it is highly pertinent to binge drinking as an increased disinhibition represents a risk factor for alcoholism and other inappropriate behaviors. The current study was designed to investigate the effects of binge drinking on the neural dynamics of response inhibition in young adults. Participants were 39 (23 women) healthy, right-handed subjects with a mean age of 23.7 ± 3.4 years who were prescreened for alcohol use to determine eligibility. Control participants reported drinking 1.6 ± 0.8 days per week and 2.4 ± 1.2 drinks per occasion, while Binge participants reported 3.1 ± 1.0 and 5.2 ± 1.7 drinking days and drinks, respectively. The two groups also differed in the number of binge and blackout episodes. During a Go/Nogo task, participants were instructed to respond to a pre-potent stimulus (80% of the time), and to occasionally withhold response (20% of the time). EEG signal was recorded with a 64-channel BrainVision system, and a Morlet wavelet transform for theta (4–7Hz) frequency was applied. Preliminary results suggest that Binge participants respond impulsively, as they commit significantly more premature responses (ones made too early) than Control participants. Indeed, self-reported impulsivity and drinking levels correlate positively with the inability to withhold responses in Binge participants. Event-related theta power is greater to Nogo trials overall. However, it tends to be reduced in the Binge participants in a central scalp location. These preliminary results are consistent with and extend prior reports of decreased theta in chronic alcoholics and under acute intoxication. The present results suggest that a history of binge drinking impairs response inhibition as reflected in theta oscillations which may further contribute to the inability to refrain from harmful levels of drinking.

The Effects of Binge Drinking on the Neurodynamics of Decision Making under Conditions of High and Low Response Conflict
Stephen Cruz, Biology (U)
Ksenija Marinkovic, Psychology

The ability to override automatic and habitual responses when presented with conflict is an indispensable function of cognitive control. Previous research has shown that cognitive control is diminished by long-term excessive drinking and during acute alcohol intoxication especially within the prefrontal network. However, despite great prevalence of high risk alcohol consumption in young adults, studies investigating the persistent neurophysiological effects of heavy alcohol consumption are still scarce. The purpose of this study was to investigate brain indices of cognitive control in heavy and moderate drinkers during a modified Stroop naming task. Thirty-two (20 women) healthy, right-handed subjects (24.0 ± 3.4 yrs) were screened for their alcohol consumption habits. Sixteen subjects reported heavy episodic drinking patterns consuming 16.7 standard drinks per week on average, compared to control subjects who consumed 3.3 standard drinks per week. Subjects performed a modified Stroop naming task which elicited high and low levels of response conflict on congruent and incongruent trials respectively. Continuous EEG signal was recorded with a 64-channel Brain Vision acquisition system. Analysis of correct trials was performed in time domain as event-related potentials (ERPs). Additionally, data were analyzed with Morlet wavelets in time-frequency domain for theta (4–7 Hz) frequency band. It was hypothesized that heavy drinkers would demonstrate reduced performance on the Stroop task, reduced ERPs, and reduced theta power especially on high conflict trials. The study is currently in progress, but a preliminary analysis of behavioral performance revealed a main effect of condition with subject consistently demonstrating lower accuracy and slower response times for incongruent trials. Females demonstrated significantly faster reaction times than males overall, but no significant interaction between condition and drinking groups was observed. A preliminary ERP analysis revealed a strong trend towards statistically significant group differences on high-conflict condition. Incongruent trials elicited a greater late positivity in control subjects than in heavy drinkers over the frontal areas. Though preliminary, these results indicate that binge drinking may affect the prefrontal network that subserves cognitive control and the ability to suppress automatic, in favor of relevant responses, which could contribute to inability to refrain from heavy drinking.
Session D-11

**Poster: Big Data Biology**
Friday, March 4, 2016, 2:15 – 3:45 pm
Montezuma Hall

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**Poster #14**

**Who is there and what are they doing? Using FOCUS and SUPER-FOCUS for an agile taxonomic and functional analysis of metagenomic big data**

Genivaldo Silva, Computational Science (D)
Robert Edwards, Computer Science

Microbes are more abundant than any other cellular organism, and it is important to understand which organisms are present, what they are doing, and how they are doing it. In many environments a majority of the microbial community members cannot be cultured, and metagenomics is a powerful tool to directly probe uncultured genomes and understand the diversity of microbial communities by using only their DNA.

Analyzing the taxonomic and functional profile present in a microbial community from unannotated shotgun sequencing reads is one of the goals in metagenomics for its valuable applications in biological research. Currently available tools do not scale well with increasing data volumes, which is important because both the number and lengths of the reads produced by sequencing platforms keep increasing.

We have developed two tools to address this problem: FOCUS, Find Organisms by Composition USage, an ultra fast model which uses k-mer abundance and non-negative least squares to profile any metagenome dataset in seconds and SUPER-FOCUS, SUBsystems Profile by databasE Reduction using FOCUS, an agile homology-based approach using a reduced SEED database to report the subsystems present in metagenomic samples and profile their abundances.

The tools were tested with over 100 real metagenomes, and the results shows that our approaches accurately predict the taxa and subsystems present in microbial communities, and FOCUS and SUPER-FOCUS are respectively over 30,00 and 1,000 times faster than other tools.

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**Poster #13**

**Insights into the Assembly of the Threonylcarbamoyl Adenosine (t6A) Biosynthesis System**

Sunjeet Baadkar, Biochemistry (M)
Manal Swairjo, Chemistry

The anticodon stem and loop domain (ASL) of a tRNA is the region that drives protein synthesis by binding to the cognate codons on mRNA during ribosomal translation. Modifications of this region are necessary in one third of all bacterial tRNAs for recognition and translocation, they enhance aminoacylation properties of tRNA, and prevent ribosomal frameshifting. T₆ₐ₁₃₇ is a complex, universal modification found at position 37 of tRNAs decoding ANN codons (N is any nucleotide) in all lifeforms. Four essential proteins, TsaB, TsaC, TsaD, and TsaE, are responsible for T₆ₐ₁₃₇ biosynthesis in bacteria. The essentiality of the T₆ₐ₁₃₇ pathway makes it a compelling potential antibacterial target.

Although the T₆ₐ₁₃₇ system has been studied in recent years, the underlying molecular mechanisms involving tRNA recognition and specificity of the biosynthesis proteins remain unknown.

To investigate the molecular mechanism of tRNA recognition by T₆ₐ biosynthesis proteins at structural and biochemical level, all four protein subunits (TsaB, C, D, E) were cloned, overexpressed and purified by metal affinity chromatography either as a his-tag or non-his-tag form. Analytical gel filtration experiments confirmed that TsaB and TsaD are homodimers, whereas TsaC eluted exclusively as a monomer. Further, ATP-dependent homodimerization of TsaE was observed. Using native gel shift and size exclusion chromatography experiments, we confirmed that heterodimerization of TsaB and TsaD, and established that TsaB, TsaD, and TsaE form a compact ternary complex only in the presence of ATP. Moreover, intrinsic Trp fluorescence quenching studies demonstrated that TsaB-TsaD heterodimer binds tRNA more tightly compared to individual subunits.

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**Poster #15**

**An Algorithm to Identify Anomalous Data in Big Data Generated by Air Particle Monitors**

Dylan Petersen, Statistics (U)
John Belletiere, Graduate School of Public Health

Background: Project Fresh Air is randomized clinical trial testing whether real-time feedback from air particle monitors and one-on-one coaching could protect household members from exposure to secondhand smoke. Identification of airborne particle-generating events (PGEs; e.g., cigarette smoking, cooking) is valuable for evaluating the intervention. We detected anomalous data that were caused by inadequate electrical power to particle monitors. These anomalous data resulted in the identification of more PGEs than were truly present in homes. We developed an algorithm to identify the anomalous data. Methods: Anomalous data were present in 128 (controls n=66, intervention n=62) of 239 homes. Large fluctuations in particle levels occurring within 10-to-50 second intervals were observed to be a direct response to insufficient electrical power to air particle monitors. These anomalous data resulted in the identification of more PGEs than were truly present in homes. We developed an algorithm to identify the anomalous data.
Meta-kaks: a tool to measure natural selection strength on a metagenome

Vito Cantu, Computer Science (D)
Robert Edwards, Computer Science

The Ka/Ks ratio is a measure of the strength of natural selection over a protein coding gene. It is calculated by dividing the number of non-synonymous mutations (those that result in an amino-acid change) per non-synonymous site (Ka) over the number of synonymous mutation per synonymous site (Ks). As such Ka/Ks is already normalized by the length of the protein and its amino-acid composition, so Ka/Ks ratios obtained from different genes are directly comparable.

If Ka/Ks > 1 the gene is said to be under positive selection; new variants are advantageous and genetic diversity grows in the population. If Ka/Ks < 1 the gene is under negative selection and new variants are eliminated from the population. If Ka/Ks=0 the gene is under neutral selection. Two genes in the same genome can be under different kinds and strengths of selection.

Normally, Ka/Ks is calculated from the sequences of two or more known genes. In this work we developed a tool to calculate the strength of selection acting on a protein family in a particular environment.

Our tool use Spades to assemble meta-genomes, the SEED database to get protein families, tblastx to do homology based searches, custom scripts to construct axt files from tblastx output and kaks-calculator to get the Ka/Ks ratios from those axt files.

The metagenomes were provided by Forest Rohwer’s lab. All code can be found at https://github.com/Adrian-Cantu/meta-kaks.

To test our tool we calculated Ka/Ks for three phage protein subsystems (tail, tail fiber, integrase) on 29 viral metagenomes from different oceans around the world. We expect those ratios to correlate differently with the environmental variables of the sampling sites (temperature, pH, number of bacteria) depending of the subsystem. We found that strong negative selection acts on integrase genes in environments with higher concentrations of bacteria. It has been proposed that phages tend to integrate into the bacterial genome under those conditions.

Our results show that we can detect genes that are under strong selective pressures in metagenomes. That may indicate how the environment acts on the genome.

543 Poster #17
Characterizing Unknown, Virally-Encoded Open Reading Frames from Metagenomic Data

Matthew Gallagher, Biology (M)
Anca Segall, Biology

The majority of viral genes currently carry no known function and elude most characterization via bioinformatics (such as BLAST, et al.). Additionally, it is thought that this virome makes significant contribution to many physiological processes in bacteria, and humans (via both commensal flora and pathogenic bacteria). It is therefore of great importance to make progress characterizing unknown genes obtained from metagenomic analyses of the gut microenvironment. We propose to characterize a group of 72 ORFs chosen from a pool of approximately 29,000 ORFs obtained from human fecal samples using phenotypic microarrays designed to test for metabolic activity or stress protection. The samples come from over 108 twin samples (representing 19 families and three time points per person) who are discordant for obesity (i.e. one twin is obese and one is not), and following removal of bacterial and eukaryotic DNA represent the gastrointestinal virome. The final pool was chosen based on the following criteria: ORF length greater than 400 base pairs, prediction of a non-structural gene by artificial neural networks trained to identify phage structural proteins, proximity to att sites, and enrichment in either obese or non-obese populations. Following selection, the ORFs were synthesized into plasmids carrying an arabinose-inducible promoter and an ampicillin resistance gene. These plasmids were then transformed into E. coli cells and are currently being tested using phenotypic microarrays and other cellular and molecular assays to describe any potential functions of these genes. Some genes showed weak alignment or distal homology to known genes, several of...
which have a related gene in \textit{E. coli}. Here we describe a series of experiments attempting to rescue knockout strains of \textit{E. coli} obtained from the Keio collection using this small group of potentially related genes. Of particular note is a virally-encoded gene that shares sequence information with various amidases. This plasmid containing this gene was transformed into \Delta amiC \textit{E. coli} in order to alleviate the growth defects (daughter cell chaining) seen in the deleted strain.

\textbf{544 Poster #18}  
\textit{Global virome} 
Ana Georgina Cobian Guemes, Cell and Molecular Biology (D)  
Forest Rohwer, Biology  

Viruses are the most abundant and diverse biological entities on Earth, however we don’t know which are the most abundant ones or what their global distribution is. We present a meta-analysis of publicly available datasets to address these questions.  
Viral to microbial ratio (VMR) is a measurement of how many viral like particles per microbial cell are present in a sample.  
We calculated the total number of viral like particles on Earth by multiplying the number of prokaryotic cells by the estimated VMR for each major biome. The major biomes we are studying are: marine, freshwater, other aquatic, sediments, soil, human-associated and other host-associated. VMRs and number of prokaryotic cells on each biome were obtained from an extensive (65 sources) literature search.

We estimated that there are $8.23 \times 10^{31}$ prokaryotic viruses on Earth, 96\% of them being in soil and sediments—two biomes that combined currently account for only ~2.5\% of publicly available viral metagenomes.

In addition we collected all available viromes in public databases ($n=1800$) and developed a pipeline to find the most abundant viral like sequence on Earth. First we assembled each virome and selected only contigs longer than 1000 nucleotides. We combined this database with reference genomes of prokaryotic viruses and dereplicated it. Next we mapped each virome to this database, counted the number of hits to each viral genotype, normalized and obtained the most abundant viral genotype on each biome and on Earth. Our meta-analysis found that 11\% of the 100 most abundant phage genotypes are shared between two or more biomes.

Further advances in viral ecology call for a shift of attention to previously ignored major biomes and careful application of verified methods for metagenomic analysis.

\textbf{546 Poster #20}  
\textit{Effects of Meditative Breathing on Cognition}  
Christopher Czarnecki, Psychology (U)  
Claire Murphy, Psychology  

The current study investigated the effects of meditative breathing on cognition. Thirty collegiate students (15 males and 15 females) from a large Southwestern university volunteered to perform a "neurocognitive performance test" (NCPT) provided by Lumosity. The NCPT was a battery designed to test the students on immediate memory, attention, problem solving, and delayed memory. Intake information inquiring demographic information, meditation experience, test anxiety, and GPA were delivered before delivering the first test. Half of the students were assigned to the control group, and took the test a second time with no meditative breathing instruction. The other half assigned to the experimental group, underwent 15 minutes of instruction, and practiced the meditative breathing exercises before beginning their second test.

T-tests were conducted to examine significant differences in performance between the two groups on Test-1; none were found. GPA’s were also not significantly different. Significant differences ($\alpha = .05$) at the 95\% confidence level were found in the problem-solving portion ($p=.01$) within the experimental group (Test-1; Test-2). A one-way ANOVA was conducted, and revealed the experimental group performing significantly better on the problem-solving portion compared to the control group. $[F(1,20)= 6.519, p=.019]$. A significant difference on memory was also observed between the control and experimental condition $[F(1,20) = 10.382, p=.004]$. The implication of this investigation indicates that meditative breathing influences individuals to be better problem solvers, and display a better ability for delayed memory.
**ABSTRACTS**

**547**  
**Poster #21**  
*Herbal Healing: A comparison of medicinal plant and pharmacy medication preference in two communities of La Libertad, Perú*

Marisa Alvarez, Public Health and Latin American Studies (M)  
Ramona Perez, Anthropology/Latin American Studies

Background: This study took place in Miramar and Moche, which are located in Trujillo, La Libertad, Peru. The City of Moche benefits from availability of modern medicine, however accessibility and cost are limiting factors, especially outside the Moche urban core. There is evidence of self-medication on low-cost, non-prescription medications in the peri-urban community of Miramar, often with deleterious effects. Also, there is some cursory evidence that in Trujillo’s oldest peri-urban community, La Esperanza, recent migrants to peripheral areas are maintaining sierra traditions of domestic plots of plants used in herbal remedies. This study hypothesized that medicinal plant preference would be higher in Miramar than in Moche’s urban core as a result of maintaining practical sierra folk traditions of medical self-sufficiency. Methods: With funding from the Minority Health and Health Disparities Research Training (MHIRT) grant, a cross-sectional study was conducted in the urban core of Moche and in the peri-urban community of Miramar. A questionnaire used in previous MHIRT projects was adapted and used to interview 202 participants, 101 in Miramar and 101 in urban Moche. Participants had to be 18 years of age or older, preferably head of household, and able bodied. In both communities the research team began in the most peripheral section of the community and worked inward towards the city center. Descriptive data, chi-squared, and one-way anova were analyzed using IBM SPSS Statistics Version 22. Results: Of the total respondents, 70.6% were female and about 36% of total respondents had completed secondary education, which in the U.S. is equivalent to completing high school. Of the 202 respondents, 85.6% answered “yes” that they had used or currently use medicinal plants for health reasons. No statistical significance was found between location, peri-urban or urban community, and preference in use of medicinal plants. Conclusion: Previous research indicates that peri-urban communities in Peru are more likely to use of medicinal plants. This however was not indicated in this study between the peri-urban community of Miramar and the urban core of Moche. The numbers were almost equal in preference of using medicinal plants compared with pharmaceutical medicines between the two communities.

**548**  
**Poster #22**  
*Watermelon and L-Arginine Consumption Improve Serum Lipid Profile, Inflammation, and Oxidative Stress Profile in Rats Fed an Atherogenic Diet*

Joshua Beidler, Nutritional Science (M)  
Mee Young Hong, School of Exercise and Nutritional Sciences

Cardiovascular disease (CVD) is the leading cause of death in the United States. L-arginine supplementation improves lipid profile and other CVD risk factors in rats by increasing endothelial nitric oxide synthesis. Watermelon also promotes nitric oxide production because it is rich in L-citrulline, a substrate for endogenous L-arginine production. Although both watermelon and L-arginine may reduce CVD risk, few studies have directly compared the two treatments. The purpose of this study was to compare the effects of watermelon powder versus L-arginine supplementation on blood lipids, oxidative stress, and inflammation in rats fed an atherogenic diet. Thirty-two male-weanling (21 days old) Sprague-Dawley rats were divided into 3 groups which were fed a high-fat control diet (n = 10) or the control diet plus either 0.5% watermelon powder (n = 11) or 0.36% L-arginine (n = 11). After 9 weeks of feeding, both L-arginine and watermelon groups exhibited significantly lower (P<0.05) serum triglycerides, total cholesterol, and low density lipoprotein cholesterol. High density lipoprotein cholesterol was not significantly different between the groups. L-arginine and watermelon groups had significantly lower (P<0.05) levels of inflammation, indicated by C-reactive protein, and oxidative stress, indicated by thiobarbituric acid reactive substances. The liver function markers aspartate aminotransferase, alkaline phosphatase and lactate dehydrogenase were significantly lower (P<0.05) in the L-arginine and watermelon groups, but no significant differences were observed for alanine aminotransferase or creatine kinase. These findings indicate that watermelon extract improves risk factors for CVD in rats through better lipid profiles, reduced inflammation, and increased antioxidant capacity. The study was funded by The US National Watermelon Promotion Board and San Diego State University N302L Advanced Nutrition Laboratory.
549  Poster #23  
**The Association between the Level of Physical Activity and Health Limitations**  
Raquel Funches, Sociology (M)  
Audrey Beck, Sociology  
The aim of this study is to investigate and discover the impact of health limitations on the level of physical activity. These particular conditions affect 117 million adults in the United States and require more focus on how they potentially alter participation in physical activity. For many, experiencing any health barriers such as respiratory, musculoskeletal, or psychological (or any health) conditions deters an individual’s level of physical activity and limits their participation.

OLS regression was utilized to examine the relationship between health limitations and the level of physical activity. All variables included in the study have been retrieved from the 2014 Integrated Health Interview Series (IHIS), a comprehensive Web-based system that provides annual data based on the National Health Interview Survey (NHIS). The analytic sample includes adults age 18 and older (N=71,742); missing values were also excluded from the data. Preliminary results indicate a significant, negative relationship between some forms of health limitations and physical activity. Results suggest that those with a current health limitation will participate in exercise less than those without one, but that the type of limitation matters for activity level. Targeted interventions may be especially important for some types of health limitations to improve exercise as extant literature suggests a feedback effect where low levels of exercise can worsen health limitations.

550  Poster #24  
**The Effect Of Mitral Prosthesis Design and LVAD Support On Intraventricular Flow**  
Josue Campos, Mechanical Engineering (U)  
Karen May-Newman, Mechanical Engineering  
Some heart failure patients require implantation of a Left Ventricular Assist Device (LVAD), an implanted pump that boosts blood flow. Many of these patients also have a heart valve prosthesis (HVP) due to chronic cardiovascular disease. Little is known about how these devices alter the blood flow field through the heart when combined, and the correlation to thrombus development. Our goal in this study is to quantitatively describe how the LVAD alters intraventricular flow combined with HVP.

Particle Image Velocimetry of a cardiovascular mock loop is used to measure the flow field in a silicone model of the LV supported with a HeartMate II LVAD. A porcine bioprosthetic valve (BPV) is placed in the aortic position, and a variety of HVP are tested in the mitral position including a BPV, a tilting disc valve (TDV), and a bileaflet mechanical valve (BMV). Two conditions are studied, representing low LVAD support (LVAD speed: 8 krpm) and high LVAD support (LVAD speed: 11 krpm). During low support, a portion of the flow during systole bifurcates towards the LVAD outflow at the apex. During diastole, the normal vortex pattern with the BPV starts with two counter rotating vortices. The clockwise anterior vortex grows during diastole, developing a large positive circulation and KE, while the counterclockwise posterior vortex dissipates against the LV free wall. The BMV and TDV exhibit a similar vortex pattern but lower LVAD outflow during systole when oriented towards the free wall. When the TDV is oriented toward the septum, the vortex pattern completely reverses and the LVAD outflow bifurcates from the opposite side of the LV closer to the septum rather than the free wall as observed in the BPV. With high support, all of the flow exits through the LVAD. The results follow the same pattern observed for low LVAD support but with a higher output through the LVAD. Additional analyses to evaluate pulsatility and areas of flow stasis will enable a comparison of the efficiency of each HVP with the LVAD in order to predict the risk of thrombus formation for patients with this combination of cardiovascular medical devices.

Session D-13  
**Poster: Engineering**  
Friday, March 4, 2016, 2:15 – 3:45 pm  
Montezuma Hall

551  Poster #25  
**Coastal Air-Sea CO₂ Exchange from the Scripps Pier in San Diego**  
Hannah Joss, Environmental Science (U)  
Melissa Ward, Ecology  
Carbon dioxide (CO₂) is the leading greenhouse gas contributing to global climate change and the ocean absorbs about a third to a quarter of the total CO₂ released into the atmosphere annually (Sabine et al. 2004). Coastal seas are largely responsible for this oceanic CO₂ absorption; yet their contribution to the total global carbon budget remains poorly constrained due to their heterogeneous, dynamic nature.

While any data regarding CO₂ fluxes in coastal zones is valuable to contribute to this gap in our knowledge, this year’s El Niño provides a unique opportunity to further understand how these fluxes may differ with extreme changes in oceanographic conditions. Moreover, many of the changes that occur in El Niño
years may be indicative of future oceanographic changes predicted to occur under current climate change projections. The project presented here measures CO$_2$ fluxes over coastal waters from the Scripps Pier in San Diego, California using the eddy covariance technique. This technique is an atmospheric method used to measure trace gas fluxes. More specifically, this system consists of an anemometer collecting wind speed and direction and an IRGA (infrared gas analyzer) gathering CO$_2$ and H$_2$O densities which are continuously recorded by a data logger. We hypothesized that the sea surface in summer months would act as greater sink for CO$_2$ than the winter months, given the greater potential for biological drawdown of CO$_2$. Our results thus far have largely supported this hypothesis and provided us a monthly estimate of how CO$_2$ in this coastal zone absorbs or emits, and how these sink-source dynamics change throughout the year. However, as we continue to collect and analyze data, we plan to analyze the correlation between these fluxes a large number of environmental and oceanographic parameters to better understand what drives variability of these fluxes. This will give us a better understanding of the role coastal seas in the carbon cycle, and will ultimately be added to the body of literature used to improve our climate change projections and inform policy decisions.

**552 Poster #26**

**Spatial Assessment of Ecosystem Impacts from Recreational Trails in the San Bernardino National Forest**

Ian Crano, Civil Engineering (M)
Alicia Kinoshita, Civil, Construction, and Environmental Engineering

Impacts of recreational trail users on their surrounding ecosystems and watersheds can have significant impacts in areas where recreational trails are not planned carefully. Even in well-planned systems, both user created and sanctioned trails continue to degrade the ecosystem and watershed. These impacts include: noise pollution, erosion/geomorphic impacts, weed invasion, increased travel into virgin areas, water/soil pollution and decreased biodiversity near trails. The goal of this project is to provide a tool that accurately assesses the impacts of recreational trails in the San Bernardino National Forest, near Big Bear Lake, CA. This project will minimize the need for field-based surveys and data that can often be impractical, time intensive, expensive, and inconsistent due to variability in personnel experience, objective analysis, and training. This work will utilize a simple data set and Geographic Information System (GIS) based spatial analysis to predict high impact trail segments during a desktop assessment. This would in turn accelerate and increase the accuracy of decision making related to managing trail systems. The components of the GIS analysis are readily available to the public, reliable, and updated with reasonable frequency. A combination of endangered or sensitive species locations, elevation models, soil types, and trail spatial data are utilized to determine the relative impact of each trail within a small sub-system of trails. Field surveys of the sample area are then compared to the desktop analysis results. A positive result is found in the ability of GIS to predict areas at highest risk for impact. The methods developed during this project will be further developed to create a simple model with wide applicability for analyzing trail systems.

**553 Poster #27**

**Modeling hydro-geomorphic responses in the Waldo Canyon Fire**

Samira Nourbakhshheidokhti, Water Resources Engineering (M)
Alicia Kinoshita, Civil, Construction, and Environmental Engineering

Wildfire can significantly impact on the watersheds hydrology by changing soil properties and removing vegetation. Altered channel geometry within burned watersheds have the potential to decrease time of concentration and increase time to peak flow, flow capacity, and velocity. Post-fire consequences include increasing runoff, sediment yield, debris flows, and flash flooding downstream. This research applies the Automated Geospatial Watershed Assessment (AGWA) framework based on KINematic Runoff and EROSion (KINEROS2) and Soil & Water Assessment Tool (SWAT) to model post-fire runoff and sediment yield in the 2012 Waldo Canyon Fire in Colorado. This presentation will focus on KINEROS2, which is a GIS-based model that estimates post-fire infiltration, runoff, peak flow, sediment yield, and sediment discharge in watersheds. The required parameters includes digital elevation models, soil, land cover, and soil burn severity. KINEROS applies these data layers to parameterize, execute, and spatially visualize runoff and sediment yield. Field data from Williams Canyon will be used to validate the post-fire model. Terrestrial Light Detection and Ranging (LiDAR) data provides estimates of observed sediment delivery. LiDAR is high-resolution images of channel structure and geomorphic changes for images between post-fire storm events. This study will calibrate model parameters such as channels and hillslopes Manning’s roughness (n), and channels and hillslopes hydraulic conductivity (k$_h$). Spatial modeling will provide insight into post-fire patterns for varying treatment, burn severity, and climate scenarios. Results will improve our understanding of wildfire effects on watershed processes and post-fire hydrology and geomorphology alternations and will guide management of water resources and mitigation efforts.
**Poster #28**

**Investigating satellite-based evapotranspiration after wildfire in southwestern US**

Patrick Poon, Civil Engineering (M)
Alicia Kinoshita, Civil, Construction, and Environmental Engineering

Evapotranspiration (ET) is an important water-energy flux in the hydrological cycle that transports water from soil (evaporation) and vegetation (transpiration) to the atmosphere. Governed by complex and varying interactions between land, vegetation, and the atmosphere, ET is perhaps the most difficult hydrologic component to estimate. Further, human-induced climate change, forest management, and natural processes encourage the increase of wildfire occurrences, which impact soil properties, vegetation structure, and hydrologic processes. This research consists of utilizing the remote sensing based Operational Simplified Surface Energy Balance (SSEBop) product to analysis pre- and post-fire ET within the 2011 Las Conchas Fire in New Mexico. The study domain consists of pixels that are 1 by 1 kilometers and each pixel is associated with a precipitation, burn severity, and ET value. Preliminary results show that high, moderate, and low soil burn severity ET significantly decreases. The seasonal trend is altered approximately 1-2 years after the fire. The SSEBop ET is compared with 4 ground-based meteorological stations nearby or within the burn site and has high correlations ($R^2 > 0.85$) with energy-based estimates, but poor correlations with temperature-based ET methods ($R^2 < 0.12$). Ongoing research will investigate sensitive satellite-based post-fire variables, such as land cover, vegetation type, and land surface temperature, which may improve remotely-sensed ET estimation. This study will provide a better understanding of the impact of wildfire on ET to improve hydrological estimates, ecosystem monitoring, and climate studies in regions undergoing acute environmental disturbances.

**Poster #29**

**Ultra-long time prediction of reactive solute transport in geologic formations using spatio-temporal upscaling: theory and numerical experiments**

Farzaneh Rajabi, Mechanical Engineering (D)
Ilenia Battiato, Mechanical Engineering

Long-time predictions of reactive transport in porous media under time-dependent boundary conditions and/or forcing factors require the formulation of continuum scale models for time-averages. Yet, as every macroscopic model, time-averaged models can loose predictivity and accuracy under certain conditions. This is true whenever lack of temporal and spatial scale separation occurs. In this work, we consider reactive transport of a solute undergoing a heterogeneous reaction and subject to time-varying boundary conditions in a periodic porous medium. By means of homogenization method, we derive macro-time continuum-scale equations and show i) that the dynamics at the macro-scale (Darcy-scale) is strongly influenced by the interplay between signal frequency at the boundary and transport processes at the pore level and ii) under which conditions space-time averaged equations accurately describe pore-scale processes. Finally, we test our theoretical results through numerical simulations of transport in a planar fracture with reacting walls and time-varying boundary conditions at the inlet. Our analysis shows a good match between numerical simulations and theoretical predictions.

**Poster #30**

**A General Multiscale Hybrid Method for Transport through Complex Porous Media**

Mehrdad Yousefzadeh, Mechanical Engineering (D)
Ilenia Battiato, Mechanical Engineering

Porous media flow and transport in the subsurface can be described over a hierarchy of scales ranging from atomistic to continuum. Depending on the physics of the problem we ought to incorporate all relevant scales. Often the behavior of the system is controlled by the phenomena at the pore-scale. Therefore accurate and efficient modeling of any large domain requires simulating parts of it at the pore-scale (i.e., wherein continuum models become invalid) and the rest at the continuum scale. Hybrid models combine pore-scale and continuum-scale representations. Desirable features of hybrid models are: 1) their ability to track where and when to use pore-scale models, i.e. their adaptability to time- and space-dependent phenomena, 2) their flexibility in implementing coupling boundary conditions, and 3) significant computational speed-up when the sub-domain wherein pore-scale simulations are required is much smaller than the total computational domain. Moreover, coupling conditions should be physics-based in order reduce the overall number of assumptions. We propose a general, robust and non-overlapping hybrid scheme based on IBM to model flow and reactive transport in porous media. The suggested algorithm has been numerically tested for several transport and flow scenarios.
Effects of Iconicity on Acquisition of American Sign Language in Adult Learners
Sara Campbell, Psychology (U)
Phillip Holcomb, Psychology

An iconic sign is one that has a non-arbitrary mapping between the form and the meaning of the sign. Previous research indicates that acquisition and retention of American Sign Language (ASL) vocabulary is enhanced for signs that are highly iconic compared to signs that are not. The present study explores how differences in sign iconicity affect reaction times (RTs) and accuracy in translation tasks as a function of learning. During two sessions, monolingual adults with no previous ASL experience were taught 80 ASL signs using an associative learning paradigm in a laboratory setting. The to-be-learned signs were selected for iconicity as rated by hearing nonsigners from ASL-LEX, a lexical database for ASL. Forty of the signs were rated high and 40 were rated low in iconicity. During learning each sign was presented as a short video clip produced by a native signer and the English translation of the sign was presented on the screen both before and after the ASL clip. Associative learning occurred over two sessions separated by 24-48 hours. After the first learning block, and at two other times during learning (prior to the second learning block and then again just after), participants were given a translation test in which they viewed an ASL clip and then chose between two possible English translations. Both RT and accuracy were recorded. Preliminary results revealed faster RTs and greater accuracy for high than low iconic signs across the three forced-choice tests. Consistent with previous research this result suggests that the level of iconicity of a sign can have a distinct effect on a participant's ability to recognize and retain signs in the earliest stages of ASL learning. There was also a notable decrease in RTs for low but not high iconic signs across learning. This pattern is consistent with the hypothesis that learning was more difficult for low iconic signs which resulted in a slower progression of decreasing RTs, while for highly iconic signs learning occurred more quickly towards the beginning of learning resulting in overall faster RTs and a flatter reaction time function.
scanning may bias results, producing spurious group effects. Objective: To determine whether stringency of motion-specific quality control (QC) alters findings of group differences in diffusion measures. Method: DWI was gathered from 57 ASD and 50 typically developing (TD) participants. Groups were compared at 3 levels of QC stringency: (1) Prior to screening, (2) Following visual inspection and exclusion of scans with visible signal dropout, image noise, or shifts of head placement, and (3) After further matching groups on quantitative measures of inter-volume translation, average rotation, proportion of slices with signal dropout, and dropout severity. At each stringency level, groups were compared on FA, MD, RD, and AD (axial diffusivity) using two analytic approaches: Tract-Based Spatial Statistics (TBSS) and probabilistic tractography. TBSS Results: Without quality filtering, FA was significantly reduced in ASD compared to TD diffusely throughout the right hemisphere. This effect remained, but to a lesser extent, after visual QC. After further quantitative matching, no significant differences were found for FA. None of the comparisons resulted in significant group differences for MD, AD, or RD. Tractography Results: Without quality filtering, the ASD group had significantly reduced FA in the inferior longitudinal fasciculus (ILF) and higher RD in the right hemisphere than the TD group. After visual QC, these effects disappeared, but elevated RD was revealed in the ILF in ASD. This effect remained after quantitative matching, and significantly higher MD was also found in the ILF. Conclusion: Group differences in head motion can substantially bias DWI findings. False group effects appeared when groups were poorly matched for motion, both with TBSS and tractography approaches. Optimal motion matching eliminated these artifactual effects. At the same time, with tractography, stringent QC and group matching also revealed subtle diffusion differences not previously seen in less tightly matched data.

561  Poster #35
The role of feedback and imagery (motor or visual) in sign language learning
Brittany Lee, Language and Communicative Disorders (D)
Karen Emmorey, Speech, Language, and Hearing Sciences
Models of speech production posit that hearing individuals use auditory feedback and internal speech representations (inner speech) when learning to produce new words. In contrast, signers use visual or somatosensory feedback in novel sign production and may use visual or motor imagery in inner sign. This experiment investigates the respective roles of feedback and imagery in the production and internal representation of sign language. Deaf ASL signers and hearing nonsigners were asked to reproduce 36 signs from Russian Sign Language. Participants had five chances to watch a video of a model producing each sign and to imitate the sign under one of four feedback and imagery conditions: normal signing (overt signing with visual feedback), blind signing (overt signing with visual feedback obstructed by black goggles), covert articulation (motor imagery, i.e., imagining how signing would feel) and visually imagined signing (external visual imagery, i.e., imagining how signing would look from an outside perspective). Imitation attempts were coded for accuracy based on the phonological parameters of sign location, handshape, and movement. Changes in accuracy between first and last (fifth) attempts were measured. Participants also completed a movement imagery questionnaire. They were asked to perform body movements and then imagine performing those actions using either motor, internal visual, or external visual imagery before rating the ease of the imagery task on a seven-point Likert scale. Very preliminary data indicate that visual feedback does not help or hinder production performance for deaf signers, who perform close to ceiling. Production for hearing nonsigners, however, is worse when visual feedback is present. Furthermore, both signers and nonsigners perform better when signs are practiced overtly rather than imagined and rate motor imagery tasks as easier than visual imagery tasks. These findings support the hypothesis that the feedback and imagery involved in refining sign production and inner sign are largely somatosensory, rather than visual, in nature. Models of language learning should therefore include motor signals in addition to external perceptual signals to account for production and internal representations of both sign and speech.

Session D-15
Poster: Intermolecular Effects in Chemistry
Friday, March 4, 2016, 2:15 – 3:45 pm
Montezuma Hall

562  Poster #36
Expression and Purification of a Linear Tetra-Ubiquitin Protein for In Vitro Studies of IKK Activation
Garland Jackson, Chemistry/Biochemistry (U)
Tom Huxford, Chemistry
The IκB Kinase complex (IKK) signals for induction of transcription factor NF-κB in response to diverse cell stress and pro-inflammatory signals. NF-κB resides in the cytoplasm of resting cells by virtue of its noncovalent association with a member of the IκB family of inhibitor proteins. Catalytically active IKK phosphorylates IκB at a pair of serine side chains near the amino-terminus of the inhibitor. Phosphorylation of IκB quickly leads to its ubiquitination and, subsequently, its proteolysis by the 26 S Proteasome. The newly freed NF-κB translocates into the nucleus where it binds to target genes and elevates their expression. A second critical function for ubiquitin in the induction of NF-κB involves conversion of IKK from its inactive state to a catalytically active kinase complex. It has been reported that
linear polyubiquitin chains bind noncovalently through the IKKβ scaffolding subunit of IKK and prime the catalytic IKKγ subunit for activation through phosphorylation of its activation loop. The mechanism by which linear poly-ubiquitin serves to activate IKK remains unclear. In support of ongoing experiments aimed at understanding IKK activation and regulation of NF-κB, we propose to study the consequence of linear ubiquitin binding by IKK. To this end, we designed and prepared an E. coli expression plasmid containing a histidine-tagged linear tetraubiquitin protein. We expressed the protein in E. coli and purified it to homogeneity by nickel affinity and size exclusion chromatography. This yields approximately 12 mg of protein per liter of bacterial culture. Using MicroScale Thermophoresis, the equilibrium binding affinity of tetraubiquitin for an IKKβ:IKKγ complex from Drosophila melanogaster will be determined. The enzymatic activity of the complex in the absence and presence of the tetraubiquitin will be measured by the ADP-glow assay that measures the rate of ADP production by the kinase. These solution experiments will support electron microscopy studies aimed at determining the structural consequences of tetraubiquitin binding by the Drosophila IKKβ:IKKγ complex. Our long term goal is to understand how linear ubiquitin binding serves to activate IKK so that novel compounds can be developed that inhibit inflammation by blocking the interaction of ubiquitin and IKK.

 Enhancement of Silicon Solar Cell Efficiency by Attachment of Silver Nanoparticles to the Cell

Jasmine Lim, Chemistry (U)
David Pullman, Chemistry

Solar cells have been extensively researched in an effort to improve their efficiency in converting light to electrical power. A goal in the Pullman group is to use silver nanoparticles to improve the ability of silicon solar cells to absorb sunlight, specifically in the red and near-infrared regions where the absorption efficiency of thin film solar cells is small. One of the unique properties of silver nanoparticles is that they can absorb and scatter light with remarkable efficiency. We hypothesize that if the silver nanoparticles are attached, with a small spacing, to the surface of silicon solar cells, the energy absorbed and scattered by the silver nanoparticles can be transferred to the solar cell. The small spacing is required to minimize the degrading effects observed by other groups when metal nanoparticles are in direct contact with the surface. In this study, polydopamine is used as an adhesive medium for the silver nanoparticles to attach onto the silicon surface. Polydopamine is a versatile and multifunctional molecule that can attach to virtually any surface and substrate. The thickness of the adhesive layer can be controlled by varying the amount of time the silicon is immersed in the dopamine solution. Attachment of the polydopamine will be monitored by infrared spectroscopy and of the silver nanoparticles by UV-Visible-NearIR reflectance spectroscopy. Ultimately, the photoefficiency of the silver nanoparticle-modified solar cells will be measured as a function of wavelength of radiation.

Investigation of a Redox-Responsive 4 H-Bond Array Capable of Strong Self-Dimerization

Ghazwan Darzi, Chemistry (M)
Diane Smith, Chemistry

The design of stimuli-responsive systems in which supramolecular structure changes in response to external signals, such as the change in voltage of an electrode, is important for many applications, for example, self-healing polymers and gels, triggered release of entrapped molecules for drug delivery, and “smart” materials. In this study, a four H-bond ureidopyrimidinone (UPy) array with an alkyl-pyridinium, (RP), redox center has been synthesized. UPy(RP), shown below. This array prefers the tautomer that presents an ADAD H-bond motif in the starting oxidation state. Due to electrostatic repulsions and unfavorable secondary H-bond interactions, this motif would form a dimer with relatively weak H-bonding. Upon 2e⁻ reduction, where 1e⁻ is gained per R-pyridinium redox center, the H-bond strength should increase due to the loss of the repulsive charges, making the nitrogen a stronger hydrogen acceptor. Because the nitrogen is now a better hydrogen acceptor, there could be a possibility of an intermolecular proton transfer. This would encourage the tautomer to have an AADD motif that will make the H-bonding stronger by increasing the favorable secondary H-bond interactions. UPy dimers can exist in two tautomeric forms called pyrimidinol and pyrimidinone. In order to more efficiently study the electrochemistry of the two forms, two compounds, 4-acetylpyridinium (AcP) and Nmethyl-4,4'-bipyridinium (MeV+), were used as model compounds. AcP resembles the pyrimidinone tautomer and MeV+ resembles the pyrimidinol tautomer. The cyclic voltammetry (CV) scans for the two model compounds in CH2Cl2 and CH3CN show two widely spaced, reversible redox waves. In contrast, CV’s of UPy(RP) in these solvents show two closely spaced reductions. The first occurs at a potential very similar to that seen with simple model compounds. The second is considerably positive of that observed for the model compounds.
consistent with strong stabilization of the doubly reduced form by H-bonding. However, the voltammetry is complex. The first reduction is partially reversible if the scan direction is switched immediately after the peak, but irreversible if the scan direction is switched after the second reduction peak. Going through the second reduction also leads to the appearance of new oxidation waves at more positive potentials. This behavior suggests, not surprisingly, that the second reduction induces proton transfer and tautomerization. It is possible that the new oxidation peaks are due to oxidation of a more strongly H-bonded dimer. Further studies to help elucidate what is actually happening in this system will include concentration dependent CV’s and analysis of binding strength using NMR.

565 Poster #39
Measuring T4 bacteriophage adhesion to mucus using capillary electrophoresis with laser-induced fluorescence
Jacqueline Cuen, Biochemistry (U)
Dr. Christopher Harrison, Chemistry and Biochemistry

Bacteriophages (phage) are bacteria-attacking viruses that require bacterial hosts in order to replicate. Phage can be found in diverse environments, including but not limited to seawater, freshwater, soil surface, and the human colon. There are multiple types of phage and they each have a specific bacterium as a target. Enterobacteria T4 phage (T4) is a model phage known to attack Escherichia coli (E. coli), a bacterium that is found amongst many organisms’ guts. Barr et al. have previously shown that T4 adheres to the mucus surfaces surrounding its hosts. However, quantifying the strength of these interactions, and the phage proteins involved, is very challenging.

This project explores how capillary electrophoresis (CE) can be used to measure the interactions between phage and mucin, the glycoproteins that make up mucus. CE separations are performed in a narrow capillary filled with buffer, and with an applied electric field. The analytes in the capillary migrate at different rates based on their electrophoretic mobilities; a factor of their charge and size. We are investigating how a CE separation, designed to have phage pass through a plug of mucin, can be used to probe the interactions between the two. The extent to which the migration time of the phage is altered will provide information about the strength of the interaction between it and the mucin. This work will present our preliminary findings for the interactions of the T4 phage with mucin proteins.

566 Poster #40
Cyclic Voltammetry study of a Redox Active Three Hydrogen Bond Array
Ran He, Chemistry (M)
Diane Smith, Chemistry

Proton-coupled electron transfer (PCET) reactions are essential to many of the fundamental chemical processes of life. In the Smith group we are investigating the role of H-bonding intermediates in PCET by studying the voltammetry of compounds capable of multiple, strong H-bond interactions. In particular we have studied a p-phenylenediamine-based urea, U(H)H, which contains two H donor sites making a DD array. In this study, the phenyl group in U(H)H is replaced by an imidazole group to form a three hydrogen bond array, UlmH. In this array, the two major conformers both present a DDA H-bond motif. Therefore, AAD arrays, such as APy, are needed as guest compounds to form three intermolecular non-covalent contacts.

The cyclic voltammetry of UlmH has been examined in methylene chloride and acetonitrile with platinum (Pt) and glassy carbon (GC) electrodes. On both electrodes, Cyclic Voltammetry (CV) shows two, closely-spaced, reversible waves of similar height. We initially hypothesized that the first electron oxidation happens on the phenylenediamine unit, followed by rapid intramolecular proton transfer in the imidazole group. The second electron is removed at a slightly more positive potential due to the positive charge remaining on the array after the first oxidation. However, the voltammetry is observed to have a strong concentration dependence and this cannot be explained by this mechanism. Therefore, a more complicated mechanism will be presented to explain the voltammetry.

Addition of the guest, APy, results in a slight increase in the current of the CV waves of UlmH. This could be due to preferential binding and stabilization of UlmH which prevents decomposition and adsorption. Surprisingly, very little change in the potential of the CV wave is observed upon addition of the guest, indicating that oxidation does not change binding strength. Even though the H-donors in UlmH2+ should be stronger than in UlmH, the H-acceptor in UlmH2+ is weaker than in UlmH. So the two effects cancel each other.
Session D-16

**Poster: San Diego County**

**Friday, March 4, 2016, 2:15 – 3:45 pm**

**Montezuma Hall**

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**567 Poster #41**

*The Economic Effects on Education within San Diego California School District: Education and Economic Injustice*

Afflorence Knighton, Africana Studies (U)
Antwanisha Alameen-Shavers, Africana Studies

There is a great disparity that exist between schools in highly funded districts as compared to schools with lower funded. This research explores the impact economics has on education through interviews with principals and other relevant officers in San Diego Unified School District, the second largest district in the county. Research indicates that students from lower income communities are falling behind academically compared to students from higher socioeconomic status groups. Research also indicates that funding disparities impact not only academic achievement but also college preparedness. It is hypothesized that the achievement gap is due to how State funds are allocated throughout the district and within the schools. Equality must be achieved in public education across the board despite an individual's or group's socioeconomic status. To explore ways to close the achievement gap, this research uses qualitative methods to study and identify strategies that are implemented by the district to steadfastly, reduce the rates that affect students' academic success. This research is essential because of it's relevant to equality, privilege, educational advocacy and social change.

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**568 Poster #42**

*Understanding the Significance of the Imperial Valley through Filmmaking and Photography*

Daniel Rubio, History (U)
Eric Boime, History

I'm interested in writing about the Imperial Valley and why I think it's important to the State of California, the United States, Mexico, and the world. I think this is arguable because the Imperial Valley's significance is severely underrated and downplayed. My plan is to conduct original research to support my argument by interviewing Jimmy Dorantes, who is a native of Calexico (a small town in the Imperial Valley), California. Jimmy Dorantes is a photographer/filmmaker who has traveled around the world and is currently in the process of making a documentary on the Imperial Valley.

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**569 Poster #43**

*Resource for the Ages: A History of Imperial Valley’s Tectonic Plate Activity*

Marcie Rodriguez, History (U)
Eric Boime, History

The tectonic boundary that runs through the Imperial Valley, spattering the Pacific Plate and the North American plate, have brought a plethora of resources to the valley. The volcanic activity that the boundaries created have brought forth raw materials such as obsidian, basalt, and wonder stone, which were utilized by the local tribes. As the technology that humans had changed, so did the way we use the the volcanic activity. Once humans learned to harness the heat of the earth to create energy, the Imperial Valley became a perfect location to begin producing energy.

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**570 Poster #44**

*Is San Diego an El Niño Ready City?*

Christina Stewart, Environmental Engineering (U)
Alicia Kinoshita, Civil, Construction, and Environmental Engineering

El Niño is characterized by the periodic warming of sea surface temperatures along the equator that occurs approximately every three to seven years. For San Diego, California, this typically means warmer summers and wetter winters with above normal precipitation and frequent storms between December and March. Previous El Niño years associated with heavy precipitation and flooding in southern California are 1982–83 and 1997–98, however, the 2015–2016 El Niño is developing into the largest event on historical record with potential for significant impacts. This research seeks to define the characteristics of an El Niño ready city (ENRC). Focusing on San Diego’s preparation for the current 2015–2016 El Niño provides an opportunity to understand current and ongoing management for hazards in urban areas. Throughout the 2015–2016 winter, interviews with key agencies in the City of San Diego such as the Department of Transportation and Storm water, Lifeguard Services and River Rescue Team, Office of Emergency Services, and the National Weather Service will provide insight into the practices in place for flooding hazards. Interviews will also highlight new management and preparation.
that are for the 2015–2016 El Niño. This research will also identify lessons from previous El Niño years and evaluate whether these lessons were learned or not learned. This includes practices such as culvert maintenance and public outreach and awareness. Initial data shows that San Diego is actively preparing for El Niño events, however, challenges arise from inter-agency communication and coordination. Results will improve our understanding of El Niño ready cities and will identify strengths, opportunities, constraints, and challenges for San Diego. It is anticipated that this research will extend to other cities and will also support future international collaborations and a cross-border comparison in Tijuana, Mexico.

571 Poster #45
Local Resident Input on Port of Entry Design
Rachel Christensen, Latin American Studies/Public Administration (M)
Ramona Perez, Anthropology/Latin American Studies

Community residents should be consulted in in the design of infrastructure that they use regularly. However, due to both reasonable constrictions and an inappropriate prioritization, community input is often not solicited nor incorporated. This poster presentation will ask: what has the immediate border community of San Ysidro, California requested of the agencies responsible for updating the San Ysidro Port of Entry (SYPOE)? Research will examine planning documents and minutes from community outreach meetings to see which of the many agencies responsible for updating the SYPOE have entertained community input. Community requests will be coded by priority and impact to the community and presented to experts from the primary government agencies involved in the project. Interviews with these same experts will then inform further research to recommend ways to better elicit community participation.

572 Poster #46
An Ethnic Comparison of Long-term Satisfied Marriages
Erika Meza, Psychology (U)
Rudy Contreras, Sciences

As divorce rates have increased over the years, research has shown an increase in the study of satisfied and successful marriages, as opposed to its contrary. The effects of divorce in individuals and families can be significantly negative, so investigating the elements that can positively influence marriages is crucial. This replicated study aimed to obtain a better understanding of long-term marriages by investigating the following research questions: (1) “How do couples explain their long-term marriage?” and (2) “Do husbands and wives perceive different factors as contributing to their long-term marriage?” The participants of this study consisted of 15 heterosexual married couples of Hispanic descent (n=30) who have been married for at least 10 years, who were in a self-reported happy marriage, and who resided in the state of California. This study took a qualitative approach on the topic, as individual interviews were conducted with each couple with the purpose to attain insight on what makes marriages last. In comparison with the original study which consisted of 15 heterosexual married couples of Caucasian descent (n=30) who have been married for at least 35 years, who were in a self-reported happy marriage, and who resided in the state of Maine, a number of cultural differences in responses were identified. Love and friendship were the only factors to have been reported similarly between the original study’s sample and the Hispanic sample. Aiming to control for generational and geographical factors, the study will also include 15 married couples of Caucasian descent (n=30) fitting the same categories as the Hispanic sample. The final results will be presented in a categorical and comparative manner. If cultural differences between this study’s samples are found to be consistent, the results could have several implications to be considered in the marriage and family therapy field.

Session D-17
Poster: Gender, Race, & Behavior
Friday, March 4, 2016, 2:15 – 3:45 pm
Montezuma Hall

573 Poster #47
Migration, Death, and Repatriation across U.S.-Mexico Borders
Evelyn Natividad, Anthropology (U)
Aion Mayes, Anthropology

Immigration has been a topic of controversy and awareness. Along the U.S.-Mexican border there are many deaths recorded of those who attempt to cross the border. Many of these people die without being identified and often experience a horrible death because of the harsh weather conditions and the dangerous environments in which they attempt to cross the border. Because of the circumstances, their families are unaware or unable to discover their fate. Fortunately, there are agencies that help people in situations like these (i.e. Border Angels in California and the Colibri Center for Human Rights in Arizona). In order to understand what efforts are being put forth in order to decrease fatalities of people crossing the border, as well as support for families left behind, we must understand these agencies’ mission statements and how their efforts are being portrayed through
successes, as well as areas of improvement. Here, qualitative and quantitative data will be presented to assess the successes and failures of these organizations, and evaluate tactics that can be employed elsewhere. For qualitative information, each agency will be researched and its mission statements reviewed for the current methods and resources they have available to help those who attempt to cross the border. The quantitative data will consist of statistics of the number of individuals who cross the border and die unidentified, and related statistics regarding cause and manner of death. The goal of this research is to be able to use anthropological methodologies to obtain information about border issues, repatriation of John and Jane Does, and what aid agencies are providing to support families and victims. As an outcome, I hope to be able to provide useful information on how repatriation is being handled by these agencies and how to further use anthropological research to help with this perception.

574 Poster #48

Does Americanness Trump Competence and Warmth? The Influence of Gender on Implicit Associations about Political Candidates

Kylie Cloud, Psychology (U)
Thierry Devos, Psychology

Perceptions of political candidates can be based on conscious and deliberative thinking, but may also reflect implicit or automatic reactions. In addition, social categories and group memberships may shape implicit associations about political candidates. Prior research has documented that White Americans are implicitly seen as more American than ethnic minorities and that men are implicitly seen as more competent and less warm than women. In the context of the 2016 Presidential election, we examined the extent to which Donald Trump and Carly Fiorina, two candidates running for the Republican nomination, were implicitly differentiated in terms of their association with the American identity and their perceived competence and warmth. We predicted that patterns of implicit associations would, at least partially, reflect the gender of these candidates. More precisely, we hypothesized that Donald Trump would be seen as more American, more competent, and less warm than Carly Fiorina. We also predicted that perceived Americanness would be more strongly correlated with perceived competence than warmth. Participants were 154 (95 women and 59 men) undergraduate college students. The sample was ethnically diverse and relatively liberal in terms of political orientation. Participants completed three Implicit Association Tests (IATs) assessing the perceived Americanness, competence, and warmth of the two political candidates (Donald Trump and Carly Fiorina). For each IAT, they were instructed to categorize pictures and words as quickly as possible. In addition, participants reported to what extent they perceived the candidates as being American, competent, and warm. As predicted, Donald Trump was implicitly seen as more American and less warm than Carly Fiorina. Contrary to our prediction, Carly Fiorina was also implicitly seen as more competent than Donald Trump. The perceived Americanness of the candidates was more strongly correlated to their perceived competence than warmth. The findings suggest that the gender of political candidates influences how they are perceived. More precisely, the American identity is more easily associated with a male candidate than with a female candidate even when the female candidate is seen as more competent and warmer than the male candidate.

575 Poster #49

The Effects of Body Mass Index and Gender on Self-Rated Health

Matthew Phutisayakul, Sociology (M)
Audrey Beck, Sociology

Society maintains a stigma that has been attached to body weight, negatively identifying individuals who are affected by obesity and blaming them for their weight. The public often frames their concern as beneficial and a means to motivate individuals to lose weight but according to research, weight discrimination affects individuals’ perception of their health. Further, females face weight prejudice more than males because of societal pressures portrayed in a patriarchal dominated culture. In order to further examine this, the role of body mass index and gender on self-rated health is investigated in this study. This study utilizes the 2013 Integrated Health Interview Series (n=1,779) and OLS regression to examine how gender and body mass index interact to shape one’s self-rated health. An interaction between gender and BMI in the form of dummy variables was used to test the hypothesis that females are more likely than males to report a lower self-rated health when they are overweight or obese. Although females are more likely to report lower self-rated health than males when body mass indexes are underweight, normal, and overweight, males report lower self-rated health when their BMI is reported as obese compared to women.
**Poster #50**

**Racial Disparities in Psychological Distress**
Susan Gates, Sociology (M)
Audrey Beck, Sociology

Managing psychological distress in response to daily stressors is a part of aging in a healthy way. With growing race-ethnic diversity in the United States, understanding health disparities becomes critical to managing future health care challenges. Although much of the current research utilizing clinical cutoffs for depression suggests that mental health is generally the same across ethnic groups, access to mental health services differ by income and race-ethnicity leading to higher rates of diagnosis of depression among Non-Hispanic whites. The purpose of this study is to reveal potential race and ethic disparities in psychological distress, a more generalized measure of psychological wellbeing. The relationship between psychological distress and racial disparities will be further examined to determine if it is mediated by education. Educated individuals generally have more knowledge about resources that can help reduce psychological distress and are less likely to engage in behavior that is negatively correlated with psychological functioning. Using OLS regression models, this study will analyze data from the 2014 Integrated Health Interview Series (N=25,793). The outcome measure, the Kessler 6 scale, will capture the frequency of six different dimensions of psychological distress. This study will contribute to the existing research by focusing on the relationship between ethnicity and psychological distress regressed against level of education to see if the relationship is mediated in any way. Preliminary results suggest considerable disparities between black and Native American women relative to Non-Hispanic white women but few differences among men. Accounting for education explains disparities between Native American and Non-Hispanic white women, but reveals a significant advantage of Hispanic women relative to Non-Hispanic white women.

**Poster #51**

**Gender, Gender Identity Salience, and Helping Behavior in Organizations**
Sandra Martinez, Industrial-Organizational Psychology (M)
Mark Ehrhart, Psychology

Organizational citizenship behaviors (OCBs) are individual behaviors workers perform that are discretionary and that contribute to the effective functioning of the organization, such as helping behaviors. Recent research on gender and OCB based on gender role theory has shown that women are perceived as more likely to perform helping behaviors. According to gender role theory, individuals internalize cultural expectations because of societal norms, which contribute to the development of their gender identity. The current study investigated the interaction between gender and gender identity salience (GIS) in predicting outcomes related to helping behavior in organizations. GIS refers to the extent to which an individual uses gender to describe other work group members. We hypothesized that GIS would moderate the relationship between gender and four different helping outcomes: autonomous motivation for helping, controlled motivation for helping, expectations to perform helping, and self-ratings of OCB helping. To test the study hypotheses, we utilized archival survey data from 658 employed SDSU students. Moderated regression analyses provided support for the hypotheses. With regard to autonomous motivation for helping, GIS was found to have a much larger impact on men’s autonomous motivation for helping than women’s, such that men with high GIS reported much lower levels of autonomous motivation for helping than men with low GIS. In contrast, GIS had a much larger impact on women’s controlled motivation for helping than men’s, such that women with high GIS reported much higher levels of controlled motivation for helping than women with low GIS. When examining self-rated helping behavior, higher GIS was associated with lower helping for men, but was unrelated to helping behavior for women. Finally, with workplace expectations for helping as an outcome, the higher women’s GIS, the more they reported that helping behaviors were expected of women. Men with higher GIS were slightly more likely to report that helping behaviors were more expected of men than women. These findings provide evidence that men and women’s perceptions of gender identity influence their motivations, expectations, and behavior with regard to helping in the workplace.
Coral reef ecosystems are a diverse, but declining habitat. Most coral reefs around the world have transitioned from coral to algal dominated benthos. The exact cause for this shift remains elusive, however there is evidence that microbes associated with algae either directly or via dissolved organic carbon (DOC) stimulation are detrimental to coral health, inducing mortality, providing space for algae recruitment and growth. We predict that effluence from each reef organism will alter the water column microbial community in contrasting ways. To determine how different macro-organisms on a reef influence microbial communities in the water column, water above replicate macro-organisms (coral, fleshy macro-algae, cyanobacterial mats, zooanthids) in the Abrolhos Archipelago (Eastern Brazil) was collected in the field. This water was pressure driven through 0.22 µm Sterivex filter to collect microbial communities. DNA from the microbes was extracted, sequenced and the taxonomy and potential metabolic pathways between reef organisms were compared. While the most abundant taxa were not significantly different, there were genera that drove differences between reef organisms including, *Vibrio, Rhodopirellula, Altermonas, Candidatus Pelagibacter, Synechoccocus, Pseudalteromonas, Synechococcus, Gramella, Roseobacter* and *Pseudomonas*. At both a broad and specific level, metabolic pathways of microbes influenced by reef macro-organisms were distinctive such as Membrane Transport ($F_{df=4} = 3.618$, $p = 0.041$), Phages, Prophages, Transposable elements, and Plasmids ($F_{df=4} = 6.363$, $p = 0.006$), Phosphorus Metabolism ($F_{df=4} = 7.276$, $p=0.004$), Protein Metabolism ($F_{df=4} = 3.234$, $p=0.026$), and Respiration ($F_{df=4} = 5.617$, $p=0.010$). These results show that dominant benthic macro-organisms influence the microbes in the water column within a single reef. Therefore, as a reef changes to algae dominated the microbial environment may become unsuitable for coral growth, establishing a negative feedback loop.
address a majority of phages with one precise, repeatable method applicable to large data sets. Application of the model to these data sets produced distributions of T numbers that closely match the cited percentages for capsids expected to be icosahedral and identified those groups with nonicosahedral capsid shapes. This result is promising, and leads to other lines of inquiry in order to refine the model, create related models for other phage groups and investigate what we can learn about the variance in capsid structure distribution. This undergraduate research project was completed as part of an overarching project currently being undertaken by the Luque Lab at San Diego State University, part of the Viral Information Institute.

581 Poster #4

Investigating the role of the LytR response regulator in Group B Streptococcal colonization and disease

Liwen Deng, Cellular and Molecular Biology (D)
Kelly Doran, Biology

Streptococcus agalactiae (Group B Streptococcus, GBS) is a commensal bacterium that colonizes the vaginal tract of healthy women. However, in immune compromised individuals, such as pregnant women, the elderly, and newborns, GBS may transition to an invasive pathogen, resulting in pneumonia, sepsis, urinary tract infections, and meningitis. Despite currently recommended intrapartum antibiotic prophylaxis for GBS-positive mothers, GBS remains the leading cause of neonatal sepsis and meningitis. Little is known about what triggers GBS to switch from asymptomatic colonization to causing invasive disease. One way that bacteria respond to environmental changes is through two-component systems (TCS). TCS typically consist of a membrane-associated stimulus sensor and a cytoplasmic regulator that alters gene expression. We hypothesize that the LytSR TCS in GBS may play a role in the bacteria’s ability to persist in the host and to cause disease. We have found that a mutant GBS strain that lacks the LytR gene induces increased inflammation in our murine meningitis model as compared to wild type. Additionally, we have seen that human brain microvascular endothelial cells secrete more inflammatory cytokines when infected with the LytR mutant. Interestingly, the LytR mutant is cleared rapidly in our colonization model while wild type bacteria are able to persist longer in the mouse vaginal tract. Further characterizing the role of LytR signaling in GBS infection can provide insight into how the bacteria stimulates the host inflammatory response. On going studies are underway to identify downstream gene targets of the LytR regulator in order to better understand the changes in gene expression that occur in the bacteria during the transition between asymptomatic colonization and infection. Ultimately, uncovering how LytR signaling affects bacterial colonization and virulence may lead to the development of more effective therapies to prevent GBS infections.

582 Poster #5

Global and Local Studies on the Evolution of crAssphage

Alejandro Vega, Biology (U)
Robert Edwards, Computer Science

In an attempt to establish a baseline of microbes found in healthy individuals, there has been concerted efforts to understand the human microbiome. These studies have lead to a better understanding of the human body and what microbes contribute to healthy and diseased individuals. We recently described the discovery of crAssphage, a bacteriophage that resides in roughly half the human population across the globe. In order to try to get a better understanding of crAssphage, I am studying the distribution and variance of crAssphage on a temporal and spatial scale. I have collected influent from various water treatment centers around Southern California and amplified crAssphage DNA via PCR. We sequenced the amplicons and performed bioinformatics analysis of the data. This has shown us how crAssphage changes over time in one geographic area, and I will continue these collections. Our collaborators from 22 countries so far have also amplified and sequenced the same region from this phage, and have shared the sequences with us. Preliminary analysis of the data shows clustering of crAssphage based on the country from which it is isolated, suggesting that this virus has evolved in different communities.

583 Poster #6

Gap filling metabolic networks using physicochemical, sequence homology, and functional coupling evidence

Taylor O’Connell, Bioinformatics and Medical Informatics (M)
Robert Edwards, Computer Science, Biology

Genome-scale metabolic models are constructed by inferring the network of metabolic reactions present in an organism from the organism’s genome annotations. The models aim to summarize the full metabolic capacity of an organism, however, the inferred reaction networks are nearly always incomplete due to incorrect or missing annotations as well as missing biochemical and organismal knowledge. Missing reactions, known as gaps, that exist in the draft network must be filled using computational approaches in order to complete the network so the model may be used to simulate growth. The most common methods for gap filling are parsimony-based, adding only the minimal set of reactions needed to complete the network and enable growth. This type of naïve approach fails to take into account evidence from the organism’s genome and is not guaranteed to produce gap-filling solutions consistent with the organism’s metabolic phenotype. The aim of this research project is to develop a gap filling algorithm based on machine learning and linear programming that incorporates physicochemical, sequence homology, and functional
coupling evidence in order to produce more accurate gap filling solutions. Gaps in the draft model will be identified by examining the reaction network for reactions missing from SEED subsystems (known biochemical reaction pathways). A random forest statistical model will be trained using feature values computed on the protein sequences of annotated enzymes present in the metabolic model. The random forest will then be used to evaluate the hypothetical proteins in the genome as candidates for each of the gaps and will output a probability that the candidate protein is, in fact, the enzyme catalyzing the missing reaction. The probabilities yielded by the random forest will then be used as weights in a weighted linear programming formulation in which the objective is to minimize the flux through unsupported reactions while holding the steady state assumption and maintaining biomass production above the threshold for growth. This will allow the determination of which missing reactions need to be added to the network while avoiding the issue of adding extra reactions that have little evidence for existing in the model.

Session G-2

Poster #7

**Design for Multimode Antenna using 3D Printing Technology**

Alejandro Castro, Electrical Engineer (M)
Satish Sharma, Electrical and Computer Engineer

Three dimensional (3D) technologies have many promising areas of potential future application. The printed electronics has emerged as promising technology of interests which include low-cost manufacture and lightweight electronic devices. By printing electronic parts, manufacturing flexibility and versatility will increase, while costs may decrease. Furthermore, 3D printing technologies are becoming more common and prominent as a mean of making solid objects or parts. This printing method is an additive technology in which objects are built up in a great many very thin layers. The development products success is critical on its profitable and access on rapid product prototyping and advance geometry for electronic parts.

In this work, we demonstrate a lightweight 3D printed triple mode circular waveguide horn antenna with corrugated chokes. The antenna is originally design at the Antenna and Microwave Lab (amL) using aluminum. In this project, the antenna is manufactured by a unique combination of 3D printing process of plastic material, a combination of polycarbonate and acrylonitrile butadiene styrene (PC-ABS) and silver conductive ink from Novacentrix which covers 6 – 8 \( \mu \)m layer thickness per coating.

A 3D Systems Fortus 400mc printer is used to fabricate the structure. The parts produced within an accuracy of ±0.005 inch or ±0.0015 inch per inch. This method covers applications from prototype of mass production. Simulation shows that this antenna design can achieve a common bandwidth 7.45GHz – 8.00 GHz of all three modes which is approximately the same from the simulation from the aluminum. In addition, measurement also has been done for this antenna. The measurement of this antenna achieves 7.2GHz – 7.8GHz in TE11, approximately 7.16GHz – 7.8GHz in TM01. Comparing this to the original design, the silver coating has enough conductivity for the first two modes but fall short on the last mode. Other measurements detail will be presented during the symposium.

Poster #8

**Modified Miller Compensated Stable Non-Foster Matching Circuit from 600 MHz to 1100 MHz for a Bowtie Electrically Small Antenna**

Ghanshyam Mishra, Electrical and Computer Engineering (D)
Satish Kumar Sharma, Electrical and Computer Engineering

A stable non-foster matching negative impedance converter (NIC) circuit from 600 MHz–1100 MHz has been designed based on the proposed concept of modified Miller compensation. Theory and analysis of Miller and modified Miller compensation circuit is presented to show its importance in achieving stable NIC response. The proposed NIC design from 600 MHz–1100 MHz is fabricated and has been experimentally verified to match a printed bowtie electrically small antenna (ESA). The fabricated NIC has also been characterized for its non-linearity behavior and power handling capability through measurement of one dB compression point (P1dB), third order intercept point (IP3), noise figure and signal to noise ratio (SNR). Measured realized gain radiation patterns for the NIC matched ESA is also presented.

Poster #9

**Dipoles Supporting Multiple Unique Radiating Modes on Top of a High Impedance Surface**

Mohana Vamshi Komandla, Electrical Engineering (M)
Satish Sharma, Electrical and Computer Engineering

An array of planar dipole antennas with unique multiple radiating modes above a high impedance surface (HIS) is proposed. The antenna consists of array composed of elements each supporting a unique radiating mode. This design has an acceptable impedance matching at the design frequency (4.6 GHz). The array of dipoles was backed with a HIS structure to create a directional radiation pattern with improved directivity. The impedance matching and also the effect of the HIS reflector are discussed and presented here.
ABSTRACTS

Poster #10

Corporate Fed 1x2 Linear Microstrip Patch Array on a Thick Substrate Material

Roshin Rose George, Electrical Engineering (M)
Satish Sharma, Electrical and Computer Engineering

Microstrip patch antennas are low-profile, light weight, low cost and easily mountable and has wide range of applications. A corporate fed 1 by 2 microstrip patch array on thick substrate of FR4 is designed with bandwidth from 2.40 GHz to 2.50 GHz. The design is based on inset fed microstrip patch element. Initially the single element is optimized then, different arrangement of element in array i.e.; side by side and on top is studied and inter-elemental spacing is optimized. The effect of large ground plane has also been incorporated in the study. The antenna has been prototyped and experimentally verified for both impedance matching and radiation patterns. These results will be presented during the symposium.

Poster #11

The Role of DNA Repair in the Control of the Retrotransposition Process

Brandon Everly, Biology (U)
Sanford Bernstein, Biology

Transposable elements are segments of DNA that have the ability to change position within the genome. These elements make up approximately 42% of the human genome, and their movement could play an important role in various diseases including cancer. The most abundant of these elements is a retrotransposon called long interspersed nuclear element one (LINE-1). This element utilizes a copy and paste mechanism to insert multiple copies throughout the genome and has an estimated 80–100 active copies. There is mounting evidence that DNA damage may cause an increase in LINE-1 retrotransposition. A suggested mechanism for this increase is that DNA double strand breaks allow for endonuclease-independent insertions. Even reactive oxygen species derived from metabolism can cause DNA damage, which could contribute to LINE-1 mobility. Our hypothesis is that certain DNA repair proteins regulate LINE-1 retrotransposition in normal and pathological tissue. We will be investigating the role of DNA repair in L1 mobility regulation using doxycycline inducible shRNAs to knock down (KD) different DNA repair genes in human neural progenitor cells (NPC). After the creation of the DNA repair KD NPC library, the cells will be transfected with a LINE-1 construct that contains an inverted EGFP gene with an intron. If the construct is reverse transcribed, spliced, and inserted into the genome, the cells will express EGFP. We can then measure the level of ectopic retrotransposition with flow cytometry and determine how permissive the cells are to L1 retrotransposition.

589 Poster #12

Optimization of 5 PRIME Ready PCR DNA Card Kit Protocol for Environmental Samples

Annabelle Burruss, Environmental Sciences (U)
Stanley Maloy, Biology

Horizontal Gene Transfer (HGT) is a common way in which bacteria pass certain genetic material on to other bacteria within terrestrial and aquatic environments. Metagenomic sequencing and polymerase chain reactions (PCR) are both common techniques used to monitor this process in real time. Nonetheless, these techniques pose challenges to the tracking process, partly due to the time and large volumes needed for DNA extraction. In order to perform more efficient and accurate environmental DNA extraction, we have optimized the 5 PRIME Ready PCR DNA Card protocol. This new protocol requires small volumes of sample water with an efficient extraction time. This extraction method allows for quick analyses when working with large numbers of samples. In order to test for the best optimization, we varied the amounts of sample water added to each PCR card as well as the drying time and drying source of the cards. We added 1, 2, 3, 4, and 5 milliliters of sample water at 1 milliliter increments to 5 separate PCR cards. We also compared the effectiveness of drying them in incubators as opposed to air dry. In order to identify which method worked best, we generated 16S PCR products on each of the extracted DNA cards from known positive 16S water samples and ran each of them on a gel. Our results revealed that adding 1 milliliter of sample water to the center of each PCR card at a time and allowing it to dry until a total of 3 milliliters is achieved yields the best results on a standard PCR. Once completely dried, only 1 millimeter disks are needed to be punched out from the center of the card and submerged in the provided solution. Air-drying the cards in-between adding sample water was quicker than incubation. Overall, total DNA extraction...
of environmental samples using the Ready PCR DNA Card Kits utilizes an average total of 3-4 hours, most of which are drying time. In the future, we intend to apply this efficient technique to monitor HGT in small scale, aquatic mesocosms, which will require multiple samplings across long periods of time.

590 Poster #13
Metal Mediated Binding at a designed Protein-Protein Interface
Brian Maniaci, Chemistry (D)
John Love, Chemistry

The structure and properties that control dimerization of Protein G B1 domain were studied using a metal templated design of the protein interface. Previously, mutations in the core of the protein were used to induce dimer formation along the antiparallel beta-sheet between the edge strands in two monomers. The beta strand interaction is favored through the destabilization of the alpha helix of the Protein G B1 domain. A de novo protein-protein interaction was designed along helix-to-helix motif which resulted in a dimer of modest binding affinity. A variety of convergent design elements were used to improve binding specificity and decrease off-target protein-protein interactions. The measured interactions were quantified using heteronuclear NMR methodologies, size-exclusion chromatography with multi-angle light scattering, and x-ray crystallography. The experimental results suggest the formation of a dimer with some protein variants existing as higher order oligomeric states. Further structural characterization is required for some of the new Protein G B1 domain variants to determine the orientation and mechanism of protein dimerization.

591 Poster #14
Detecting Unlisted Steroids in Sports Supplements
Kelsey Berger, Microbiology (U)
Chistopher Harrison, Chemistry

The purpose of this project is to devise a method for individuals to test their sports nutritional supplements for any potential steroids that may be in them, as sports supplements are not FDA regulated. Some supplement companies can embellish their product with steroid to inconspicuously make their product produce better results than their competitors and garner more profits. This poses a problem for athletes given that many sports require drug testing from the World Anti-Doping Agency; sports supplements potentially containing steroids would flag the athlete on the drug test and result in them being banned from their sport. Further, steroids in sports supplements could pose health problems in not only athletes, but the individuals that use sports supplements to complement their exercise regimens. Thus, we aim to develop a simple, instrument-free, method for individuals to test their supplements for these prohibited ingredients.

To achieve this, we are developing a colorimetric reaction that is selective to steroids and related compounds. The reaction is simple enough that non-chemists will be able to perform the reaction to test their supplements. For the procedure, we are adopting the methods of Henry Tauber's “New Color Reaction for Steroids with Perchloric Acid” published in 1952. Our approach necessitates the extraction of the steroids from the protein samples for clear results. We are developing a process whereby we can efficiently extract the steroids from the protein using chloroform. The extracted steroids are then reacted with perchloric acid, yielding a color change if present. To test the efficacy of our approach we have doped lactalbumin and a generic commercial protein supplement with known amounts of three different steroids: stanozolol, mesterlone, and ßz-methyl-testosterone. In each instance a color change was achieved and could be differentiated from cholesterol, which can yield a false positive. This poster will present our continued efforts to optimize the extraction, and to determine the lowest limit of detection for our technique.

Our focus is to make the desired testing mechanism as efficient and simple to read as possible so athletes and individuals who use sports nutrition supplements can have peace of mind with their products.

592 Poster #15
Adaptation of a Cell-Based Assay for the Search of Novel Inhibitors of HIV-1 Envelope Cleavage
Darin Abbadessa, Cell and Molecular Biology (M)
Roland Wolkowicz, Biology

Human immunodeficiency virus (HIV), the causative agent of AIDS, has resulted in over 33 million deaths since it’s discovery and remains one of the most prominent infectious pathogens worldwide. Modern therapies work to slow the progression of disease to full-blown AIDS, however treatment modalities often are associated with painful side effects that cause patients to seize treatment as well as being high in cost, thus only allowing treatment options to a portion of the global population. Additionally, the recent emergence of resistant viral strains has left patients without any choice for treatment and highlights the need for novel therapeutics to combat this terrible disease.

The work outlined here aims to monitor maturation of HIV-1 Envelope (Env) as it is transported to the cell surface for incorporation into budding viral particles. This cleavage event is vital for viral spread within the host and thus presents an attractive target for the development of antivirals against HIV-1. Here we show that by adapting our previously published assay to larger segments of the gp160 Env protein we can facilitate the search for competitors of Env cleavage as well as establish HIV-1
Env as a novel druggable target for antivirals against HIV-1. Our original assay was designed to robustly and clearly monitor the processing of a small portion (17aa) of the HIV-1 Env by the host enzyme Furin. This small portion of Env encompasses a specific recognition sequence required for Furin activity; thus each larger segment of the Env protein will also contain this sequence to ensure proper recognition/cleavage by Furin.

Our expertise in retroviral technology will allow for the creation of stably expressing cell lines for use in high throughput screening of available chemical libraries. These screens will be performed in order to search for compounds that specifically inhibit Env cleavage. It is important to note that our search will exclude compounds that directly bind to and block Furin’s enzymatic activity as disrupting this host enzyme’s function will likely result in cell death. Only compounds that bind to/disrupt the conformation of the Env protein will be considered for further characterization.

593 Poster #16
Development of Bio-Filtration Cartridge for Methane Mitigation.
Richard Hamilton, Biology (U)
Marina Kaluyzhnaya, Cell and Molecular Biology

In this project we will use methanotrophs to construct a novel microbe-based system for methane mitigation. Methane is one of the major greenhouse gases. Methanotrophs are bacteria that use methane as an energy and carbon source. With methanotroph’s we may one day be able to decrease the amount of methane in the atmosphere.

The methanotroph used in the project is a strain called Methylomicrobium alcaliphilum 20Z^R. The strain 20Z^R is being developed for a variety of biotechnological applications [1,2]. For the project we are testing activity of immobilized Methylomicrobium alcaliphilum 20Z^R cells in order to build a filtration system for methane mitigation.

Methylomicrobium alcaliphilum 20Z^R was grown in a BioFlo bioreactor with methane. Cells were collected and immobilized on Whatman 17 CHR filters. The filter units were placed into a unit filed with methane. The initial cell-viability assays demonstrated that the culture survives on the filter at the same time consumes methane. Samples of cells grown in bioreactor and on filters were collected and submitted to Metabolon (http://www.metabolon.com) for metabolic investigation.

Currently we are in the process of designing a new Bio-Filtration Cartridge (BFC), which will allow methane to flow through the filters. Once developed, the BFC unit will be 3D printed and used to measure the methane intake by Methylomicrobium alcaliphilum 20Z^R more precisely.
someone else’s experience of the vaccination process. Individuals who expressed positive sentiment towards the HPV vaccine were mostly physicians and journalists. Those who had negative sentiment towards the vaccine were mostly parents. Implications and future directions will be presented.

**595 Poster #18**

*Sensitive Detection of Biomarkers for Multiple Sclerosis Using Nonlinear Multi-Photon Laser Methods*

Jie Liang, Chemistry (M)
William Tong, Chemistry

Novel nonlinear multi-photon laser spectroscopic methods are presented as highly sensitive absorption-based detection methods for biomedical applications. Our laser methods offer inherent advantages including excellent sensitivity, small sample requirements, short optical path length, and high spatial resolution. The sensitivity levels are ideal for the detection of specific biomarkers, such as those associated with multiple sclerosis (MS). The symptoms of MS are caused mainly by destruction of myelin in the central nervous system. Due to its similarity with many other neurological disorders, MS is currently diagnosed based on symptoms and confirmed by MRI images of the brain showing lesions. Sensitive chemical-based detection methods are needed in order to detect and diagnose MS before lesions grow to the size detected by MRI. There is still a wide range of proposed biomarkers for MS since the pathology is not yet completely understood. Our study focuses on the myelin basic protein (MBP), a biomarker for MS. This biomarker is suitable for detection by our laser methods using both fluorophore and chromophore labels. In a typical wave-mixing setup, the signal is generated when the two input beams intersect in the sample containing labeled or native biomarkers. The signal is a coherent laser-like beam and can be collected with virtually 100% efficiency and minimal background noise. The signal has a quadratic dependence on analyte concentration, and hence, it is inherently suitable as a chemical sensor. Currently, biomarkers must be detected in the cerebral spinal fluid, and not in blood since concentration levels in the blood are extremely low. We plan to take advantage of our excellent detection sensitivity levels (zepto-mole or parts-per-trillion) to design and develop a reliable chemical-based detection system for early diagnosis of multiple sclerosis.

**596 Poster #19**

*How much is enough? Investigating the relationship between self-rated health and physical activity*

Elizabeta Shifrin, Sociology (M)
Audrey Beck, Sociology

How much should we exercise in order to feel healthy? Past research has firmly established the importance of physical activity on physical health. These discoveries have contributed to the formation of national guidelines that encourage the adult population to practice physical activity as a direct path towards better physical health. Recently, some attention has also been devoted to the impact of physical activity on self-rated health (SRH) status. This study seeks to examine the association of physical activity on SRH and how it may differ from its association with physical health.

The study utilized the 2014 Integrated Health Interview Series and OLS regression to examine this relationship. The three groups of interest were moderate exercisers, vigorous exercisers and non-exercisers. The findings reveal that although both types of physical activity were found to be statistically significant predictors of SRH, after a certain duration both types of activity exhibited a negative affect on SRH. In addition, it was found that people who exercise vigorously and moderately seem to have a similar perceived health up until 120 minutes of exercise per week. Exercising vigorously beyond that duration was found to be less effective than exercising moderately.

In sum, it was found that moderate physical activity contributes more to one’s perceived health than vigorous activity and that both activities have limiting effects after a certain duration. These findings suggest that existing health and exercise policies should also include the effects of physical activity on SRH. The differentiation between types and duration of activity can be utilized in formulating a more accurate and well balanced exercise programs for the general public.

**597 Poster #20**

*Get Yourself Tested: An Assessment of a Sexually Transmitted Infection Prevention Program on Twitter*

Caitlyn Carson, Health Promotion and Behavioral Science (M)
Eric Walsh-Buhi, Graduate School of Public Health

Introduction: In the U.S., sexually transmitted infections (STIs), particularly chlamydia, gonorrhea, and syphilis, are on the rise (CDC, 2015). Adolescents and young adults (aged 15–24 years) are at greatest risk for contracting an STI and account for approximately half of all new STI cases annually (U.S. Department of Health and Human Services, n.d.). The Get Yourself Tested (or GYT) initiative utilizes various social media sites (used in some form by 76% of teens) to reach the adolescent audience
and encourage STI prevention (GYT, n.d.; Pew Research Center, 2015). Methods: In the case of this study, we collected and analyzed data from the social media site, Twitter, the fourth-most-used site among adolescents. From March 15 to May 15, 2015, we searched all publicly available Twitter posts (tweets) using Sysomos (Sysomos, 2016) for the following hashtags: #stiawarenessmonth, #stdmonth2015, #gytnow, #getyourselftested, and #gyt. We collected a random sample of 5000 tweets out of the total publicly available tweets containing these keywords. A research assistant manually removed all Spanish language tweets (n=317), retweets (n=1413), and duplicate tweets (n=159) leaving a total sample size of 1704 original tweets. Employing a codebook that was created by the research team, two researchers independently and manually coded each tweet for certain source and message characteristics. This researcher ran descriptive statistics using SPSS to determine frequencies for three variables: mention of specific STIs, specific prevention measures, and specific priority populations in tweets. Results: Preliminary analyses indicate that the GYT campaign focuses primarily on HIV, adolescent populations, and preventive testing. 13.8% of tweets mentioned HIV, 4.9% mentioned Chlamydia, 3.7% mentioned Gonorrhea, 3.6% mentioned Syphilis, 3.4% mentioned HPV, and 2.9% mentioned Herpes. 12.0% of tweets mentioned teens/adolescents as a priority population, 4.8% mentioned females, 1.2% mentioned sexual minorities, and 0.2% mentioned African Americans. 59.6% of tweets mentioned testing as a prevention measure, 8.0% mentioned condoms, 0.5% mentioned abstinence, 0.2% mentioned number of sexual partners, and 0.1% mentioned PrEP. Discussion: These data can be used to determine if GYT is reaching its intended audiences, as well as indicate if there are gaps in the campaign. Implications and future directions will be discussed.

598 Poster #21
The Implications for Being Labeled a Follower Versus a Leader for Affect and Self-Esteem
Alexa Young, Industrial and Organizational Psychology (M)
Mark Ehrhart, Psychology

In the workplace, almost all positions include workers acting in the role of a follower. Currently, popular press places an emphasis on being a leader and not a follower in social contexts. Having an understanding on how workers view followers has significant implications for how employees interact with their superiors, which can impact their individual performance as well as the performance of their work group. The present study examined how being labeled a follower influenced individuals’ personal affect, both positive and negative, and self-esteem. It was hypothesized that being labeled a follower would have a negative effect on personal affect and self-esteem. Participants in the study were 153 undergraduate students who were currently employed at the time of the study. After completing a variety of measures describing themselves and their workplace including initial measures of trait positive affect, negative affect, and self-esteem, participants were randomly assigned to one of three categories. Approximately one-third of participants were told that they would best be suited to a leader role, one-third were told that they would best be suited to a follower role, and one-third were in the control condition in which they were told that they would be told at a later time whether they would best be suited as a leader or follower. Participants were then given additional measures to assess their current levels of state affect and state self-esteem. Using general linear modeling controlling for initial levels of either affect or self-esteem, the results indicated that those participants who were labeled a follower had lower self-esteem and positive affect than those who were labeled leader. In addition, no results were found for negative affect. The implications of the findings will be discussed.

Session G-5
Poster: Disparities: Health & Income
Friday, March 4, 2016, 4:00 – 5:30 pm
Montezuma Hall

599 Poster #22
Community Matters: Neighborhood Factors and Health Locus of Control
Quinn Wilson, Psychology (U)
Vanessa Malcarne, Psychology

Health locus of control (HLC) has been defined as the extent to which individuals believe they or other agents have control over their health. HLC beliefs have been related to cultural factors, such as level of acculturation and health behaviors and outcomes among Hispanic Americans (HAs). Research has connected the neighborhood environment to health behaviors and outcomes in HAs, but no research has examined the relationship of environmental characteristics to HLC beliefs in HAs. Factors in the environment that limit individual capability by way of removing choices or making choices dangerous may have an impact on
control beliefs. The present study investigated the relationship of several neighborhood variables (i.e., access to transit and open spaces, rate of severe traffic injuries) to HLC beliefs in HAs and examined whether level of acculturation moderates this relationship. HA men and women (N = 383) provided their home address, and completed the Multidimensional Health Locus of Control (MHLC) Scales, which provide information about four types of HLC (Powerful Others, Internal, Chance, God), the Brief Acculturation Scale for Hispanics. Neighborhood was defined by United States (US) census tract; neighborhood variables were gathered from the Healthy Communities Data and Indicators Project. Multi-level modeling was used to examine whether neighborhood characteristics were significant predictors of HLC beliefs, and whether acculturation moderated this relationship. Greater access to public transit was associated with more Powerful Others HLC (b = .02, p = .03) and a higher rate of severe traffic injuries was associated with less Internal HLC (b = -.02, p < .01). Greater acculturation to the US was associated with less Powerful Others HLC (b = -.29, p < .01) and more Internal HLC (b = .15, p < .01). Acculturation was not a significant moderator. In conclusion, aspects of one’s neighborhood, such as access to public transit and severe traffic injuries, are associated with Powerful Others and Internal HLC, respectively, among HAs. Although causal direction cannot be concluded from this cross-sectional study, findings are consistent with the notion that neighborhood characteristics may affect health beliefs, and consequently, behaviors.

600 Poster #23
The Effects of Ethnicity, Social Support, and Age on Hiring a Health Care Advocate
Lauren McKinley, Psychology (U)
Terry Cronan, Psychology

The field of health care advocacy developed in response to the growing complexity of the health care system. A health care advocate (HCA) is a trained professional who understands the inner workings of the health care system and can assist patients who are seeking quality care. An HCA can ensure that patients obtain the best care possible by promoting patients’ rights, facilitating informed decision making, researching various treatment options, and providing additional supportive services. Little research has examined whether specific demographic factors influence a person’s perceived likelihood of hiring an HCA. The purpose of the present study was to determine whether ethnicity, social support, and age predicted the perceived likelihood of hiring an HCA. It was hypothesized that belonging to a minority, having less social support, and being older would predict a greater perceived likelihood of hiring an HCA. Participants were 987 community members who were randomly selected and asked to complete a self-report questionnaire. Amount of social support was measured on a five-point Likert-type scale ranging from 1 (not at all) to 5 (a great deal). A linear regression analysis was conducted, in which the overall model significantly explained 2.7% of the variance in the perceived likelihood of hiring an HCA amongst participants (Adjusted R² = .027, F(3, 983) = 9.246, p < .001). In support of the hypothesis, belonging to a minority predicted a greater perceived likelihood of hiring an HCA (b = -.101, p < .001). Additionally, having greater social support predicted a lower perceived likelihood of hiring an HCA (b = -.182, p = .027). Age did not significantly predict the perceived likelihood of hiring an HCA (p > .05). These results suggest that belonging to a minority and having less social support increased participants’ perceived likelihood of hiring an HCA. More research is needed to identify other factors involved in hiring an HCA within specific populations of ethnic minorities and people lacking social support, who are actively receiving treatment for a medical condition.

601 Poster #24
Culture, cognition, and the locus of control among diabetes patients in the Imperial Valley
Geraldine Jovel, Psychology (U)
Linda Abarbanell, Psychology

Diabetes is a serious health problem that disproportionately affects Mexican-Americans. According to the Department of Health and Human Services Office of Minority Health’s website, 78% of Mexican-American women and 81% of men are overweight or obese, making them particularly vulnerable to this and other health problems. Hispanics are almost twice as likely as non-Hispanics to be diagnosed with diabetes and are 40% more likely to die from their disease. Poor nutrition and weight management are therefore often targeted by treatment programs. Mexican-Americans, however, are frequently described as having an external locus of control conceived of as a stable psychological trait that hinders them from making necessary behavioral changes. Recent work, however, suggests that locus of control can be better understood as an interaction between social, cultural and structural
factors. For example, Mexican-American women with diabetes reported experiencing more depression, social isolation and a lack of social support, making it difficult for them to implement lifestyle changes despite their efforts (Agnes et al., 2011). That is, an external locus of control resulted from rather than caused their treatment behavior. Further, studies suggest that cultural beliefs such as susto, the belief that a sudden, external fright or shock caused one’s illness, may co-exist with biomedical beliefs regarding the importance of lifestyle choices (Hunt et al., 1998). Structural factors affecting migrant populations in particular, including mobility, poor social support, and undocumented status, may restrict individuals’ ability to implement behavioral changes regardless of their knowledge or will. In an effort to understand the relationship between cultural beliefs, biological knowledge, and structural factors among this population, we interviewed 5 migrant workers temporarily residing in the Imperial Valley who have been diagnosed with diabetes. We asked about their health status and treatment history and assessed their understanding of the causes of their illness and the mechanisms of action and efficacy of different treatment options, including behavioral, pharmaceutical, and folk remedies. Our results suggest that structural factors rather than causal beliefs may have the largest impact on healthcare behaviors, treatment and outcomes. This work has important implications for diabetes prevention and management targeting this and similar populations.

**602  Poster #25**  
**Do Old Age, Dementia, Depression, and Comorbidity Affect the Likelihood of Hiring a Healthcare Advocate?**  
Symone McKinnon, Psychology (M)  
Terry Cronan, Psychology

Older adults are at high risk of developing multiple chronic illnesses and suffering from cognitive and mental health disorders. The healthcare system is difficult to navigate and designed to treat acute illnesses, often neglecting to address the multifaceted healthcare needs of older adults who require long-term care. Health care advocates (HCAs) are professionals trained to reduce the complexities of treating chronic conditions. The purpose of the present study was to examine whether age (70, 80, 90), having a cognitive or mental health disorder (i.e., dementia, depression), and comorbidity (hypertension and arthritis, otherwise healthy) affected the perceived likelihood of hiring an HCA. It was hypothesized that imagining being 90 years old with dementia and comorbid chronic illnesses would result in a greater perceived likelihood of hiring an HCA. Participants (N = 1134) recruited from a large urban cultural park were randomly selected to complete a questionnaire. Participants were asked to imagine themselves as the individual depicted in the vignette, and to indicate their likelihood of hiring an HCA to provide ten assistive and advisory services. A 3 (Age: 70 years, 80 years, 90 years) by 2 (Mental Health Status: Depression, Dementia) by 2 (Comorbidity: present, not present) analysis of covariance (ANCOVA) was conducted, controlling for participants’ understanding of the role of an HCA and participants’ confidence in their understanding of the mental health condition. There was a significant main effect for mental health condition, F (1, 1120) = 87.23, p < .001. Participants who imagined that they had dementia reported a greater likelihood of hiring an HCA (M = 7.35, SD = 1.91) than those who imagined they were depressed (M = 6.21, SD = 2.31). Better understanding the role that HCAs can play with older adults is important because the growing number of older adults may overwhelm the health care system in the coming decade.

**603  Poster #26**  
**Demographic Predictors of the Likelihood of Hiring a Health Care Advocate for Physical and Mental Health Conditions**  
Mathew Mansoor, Psychology (U)  
Terry Cronan, Psychology

The health care system is fragmented and difficult to navigate. Moreover, chronic health conditions such as arthritis, hypertension, dementia, and depression can be debilitating and may hinder patients’ ability to seek the appropriate services and their ability to make well-informed decisions about their care. Health care advocates (HCAs) are professionals carefully trained to understand the healthcare system, be informed about the symptoms and treatments of both physical and mental health conditions, and to provide special services to enhance patients’ health outcomes. Research suggests that some demographic factors, such as age, gender, ethnicity, education level, and total family income may affect the use of and difficulty level in navigating the health care system. Thus, the purpose of the present study was to examine whether these factors predict an individual’s perceived likelihood of hiring an HCA for physical and mental health conditions. The participants were 1200 people randomly selected from a large cultural park in California. Using a 10-pt Likert-type scale, participants were asked to indicate their perceived likelihood of hiring an HCA if they were diagnosed with hypertension, arthritis, and a mental health condition (i.e., dementia or depression). Participants also reported their demographic information. A linear regression analysis was conducted. The overall model significantly explained 3.4% of the variance in the perceived likelihood of hiring an HCA (Adjusted R² = .034, F (5, 598) = 5.272, p < .001). Age significantly predicted the likelihood of hiring an HCA. Participants 50 years and younger had a greater perceived likelihood of hiring an HCA than participants over the age of 50, (b = -.691, p = .004).
Moreover, female participants reported a greater perceived likelihood of hiring an HCA than did male participants (b = .816, p < .001). Ethnicity, education level, and total family income did not significantly predict the perceived likelihood of hiring an HCA (p > .05 in each case). More research is required to determine whether males and older adults feel confident in their ability to properly navigate the health care system. It is important to determine whether these populations will receive adequate care without the services of an HCA.

Session G-6
Poster: Alzheimer’s & Memory
Friday, March 4, 2016, 4:00 – 5:30 pm
Montezuma Hall

604 Poster #27
A New Test of Destination and Source Memory
Emily Van Etten, Psychology (U)
Paul Gilbert, Psychology

Destination memory refers to remembering the destination of information that is given (e.g., what you have said and to whom), whereas source memory involves remembering the source of information that is received (e.g., what you have been told and by whom). Although evidence suggests that both destination and source memory decline with aging, very few investigations have directly compared the two constructs. The aim of the present pilot study was to compare destination and source memory in a sample of healthy young adults using a novel measure designed to mimic everyday conversations. This is part of an ongoing study that will also include older adults. Twenty-three young adults (M = 18.91, SD = .67) were administered a computerized task during which facts (“what”) must be associated with a particular face (“who”). Half of the associations involved source memory, where a fact was heard and the participant must remember the face on the screen paired with the fact. The other half involved destination memory, where a face was viewed on the screen and the participant must read a fact to the person and remember the association. A paired samples t-test revealed no significant difference between the number of associations remembered in destination trials compared to source trials in young adults (t(22) = -.581, p > .05), which was consistent with our a priori hypothesis. However, young adults did recognize significantly more facts from destination trials than source trials at the trend level (t(22) = 3.425, p = .05). This finding may be explained by the higher depth of processing involved in the more active process of giving information compared to the more passive process of receiving information, which may facilitate better encoding of the facts. As part of this ongoing study, we are testing older adults to examine if aging differentially affects source and destination memory.

605 Poster #28
C-Terminally Truncated alpha-synuclein may link Lewy Body Diseases and Tauopathies
Sarah Gough, Psychology (U)
Terry Cronan, Psychology

The goal of the present study was to extend previous findings by Lewis et al. (2010) by examining temporal lobe samples of Alzheimer’s Disease (AD), Lewy body variant of Alzheimer’s disease (LBV) and diffuse Lewy body dementia (DBLD) patients to observe the relationship between a C-terminally truncated form of alpha-synuclein (α-syn 119) and phosphorylated tau. Eighty-five post-mortem samples from participants (M age = 76.08, 64% male) were immunohistochemically stained for phosphorylated tau, and α-syn 119. Nineteen AD samples, 27 LBV, 27 DBLD and 12 controls (ages 46–92) were analyzed and compared by manual semiquantitative evaluation and computer assisted image analysis. Manual semiquantitative evaluation was done by categorizing amounts of α-syn 119 neurites into four levels: absence, sparse, moderate or frequent in each disease group. Computer assisted image analysis revealed significantly more α-syn 119 neurites in all four disease cases compared to control cases (control vs. AD p < .0001; control vs LBV p < .0001; control vs DBLD p < .05). Significantly more α-syn 119 neurites were found in AD compared to DBLD cases (AD vs. DBLD p < .01), and in LBV compared to DBLD cases (LBV vs. DBLD p < .0001). Significant correlations between α-syn 119 and phosphorylated tau were found in all disease cases (DBLD p < .01; LBV p < .0001; AD p < .0001). Manual semiquantitative evaluation revealed AD neurite levels ranged from moderate (n=5) to abundant (n=14). DBLD samples ranged from sparse (n=15) to moderate (n=5) to abundant (n=7). LBV samples ranged from sparse (n=1) to moderate (n=1) to abundant (n=25). There was high concurrent validity between the two methods (p < .001, r = .79). Findings indicate the presence of α-syn 119 to be pathological and staining used identified this specific truncated form of alpha-synuclein. The causal relationship suggested by the invariable correlation between phosphorylated tau and α-syn 119 in AD pathology is a novel concept in the field and may help explain the co-occurrence of AD and DLBD pathology in the same patients such as in LBV cases.
Poster #29

Reconsideration of the “Cross-Race” Memory Bias

Taylor Lemker, Psychology (U)
Melody Sadler, Psychology

In an age where societies are generally composed of individuals of different races or ethnicities, learning about the social effects of ingroup and outgroup recognition is crucial. According to Adams, Pauker, and Weisbuch (2010), “…evaluation of faces appears to derive from the integrated meaning of the face and its relational value to the perceiver rather than to particular cues in isolation.” Simply put, an individual’s face is processed by the observer and their interpretation of that expression ultimately motivates the observer’s level of engagement, either cognitively or physically. In previous research, remembering faces of ingroup members was easier than remembering faces of outgroup members, when the eyes had a direct rather than averted gaze. In such research, however, participants were always White and were judging White and Black faces. In the current research, White-(n=71), Latino/a-(n=60), and Asian-(n=34) American participants from San Diego State University judged White and Black faces. If only White participants show a difference in recalling Black and White faces (with direct gaze) then the “cross-race” bias interpretation of past research would be supported. However, if all participants show better recall of White than Black faces, then the phenomenon is not about judging another versus one’s own race. All participants learned Black and White faces as they completed an approach/avoidance task. Then there was a surprise memory test. The memory test measured the students’ ability to accurately recall faces of the individuals that they had seen during the previous activity from other Black and White faces they had not seen before. Results showed that participants of all races—not just White participants—more accurately recalled White than Black faces with direct gaze (no differences were found for faces with indirect gaze). Implications of the results for theories on social perception of the “ingroup” versus the “outgroup” will be discussed.

Poster #30

Recall and Recognition Discriminability in Healthy Aging

Charles Moreno, Psychology (U)
Paul Gilbert, Psychology

Objective: Performance on verbal memory tests is known to decline with age. The California Verbal Learning Test–Second Edition (CVLT-II) includes a new experimental measure termed recall discriminability, which is analogous to recognition discriminability. Discriminability scores from the CVLT-II are expressed as a single d’ score, which provides the opportunity to make direct comparisons between recall and recognition raw scores. The objective of the present study was to examine the effect of age as a continuous variable on each CVLT-II score of recall and recognition discriminability in a sample of healthy adults. Participants and Method: Participants were 193 healthy adults 18–91 years old (M = 64.78, SD = 23.47), 93 of which were female. Participants were administered the CVLT-II as part of a larger neuropsychological test battery. Age was the independent variable of interest. Raw recall discriminability scores (Total, Immediate, Delayed, Free, and Cued) and recognition discriminability scores (Total, Source, Semantic, and Novel) were the dependent variables of interest. Results: Multiple regression analyses revealed that performance on each CVLT-II measure of recall and recognition discriminability significantly decreased as age increased, controlling for gender and education (p < .001). Conclusions: The findings indicate that recall and recognition discriminability scores from the CVLT-II decline with increasing age. These measures might provide more accurate assessments of recall and recognition abilities, by quantifying target words recalled relative to intrusion errors (recall) and hit rates relative to false positive rates (recognition).

Poster #31

Direct vs. Averted Eye Gaze as a Factor of Approach/Avoidance Behavior Beyond Cross Race Memory Effect

Lindsay Portney, Psychology (U)
Melody Sadler, Psychology

Research on the Cross Race Memory Effect (CRE) suggests that people are better at recalling in-group than out-group member faces. CRE has been expanded to findings regarding eye gaze, with the effect emerging only when faces display direct (than averted) gaze as direct-gaze signals increased likelihood for social engagement. The current research looks further into these findings utilizing an Approach-Avoidance Task to observe behaviors associated with the integration of direct and indirect eye gaze signals on in-group versus out-group faces. We predicted based on past research, that for stimuli with direct eye gaze, participants would have a faster approach time for in-group members than out-group members. We also predicted that direct eye gaze would promote a faster avoid response for out-group members than in-group members, based on the socially relevant perception of threat. No differences were expected on approach or avoidance trials when faces displayed averted gaze. 72 undergraduate participants were given the Approach-Avoidance Task. About half of the participants were instructed to approach or avoid based on eye gaze of faces, and the other half were instructed to approach or avoid based on the race of faces. A 2(Eye Gaze) x 2(Target Race) x 2(Approach/Avoid) x 2(Judgment Condition) mixed-model ANOVA was used. The only between group factor was judgment condition (race or eye gaze). There was a significant interaction between approach/avoid behavior...
and eye gaze direction. Approach versus avoidance behavior does not appear to be affected by direct eye gaze whereas it is impacted by averted eye gaze. Participants were slower to approach than avoid targets with averted eye gaze. Unlike prior research, this effect was not qualified by whether or not the target faces were in-group or out-group members. Thus, based on current findings, it may be that eye gaze signals are paramount for behavioral tendencies to approach or avoid people, across race. More research is needed to determine what factors have contributed to these conflicting findings, and what factors can predict over and above other conditions the social cues that may influence approach or avoid behavior.

609 Poster #32
Odor Discrimination in APOE-ε4 Carriers vs. Non-Carriers
Andrew Fiscella, Psychology (M)
Claire Murphy, Psychology

Alzheimer’s disease (AD) is a form of dementia marked by the presence of Aβ-plaques, neurofibrillary tangles and cognitive decline. One prevalent risk factor for AD is the APOE-ε4 allele, which can increase a person’s risk of developing AD by 3–12x. Currently, the only definitive diagnosis of AD is through an autopsy which shows the presence of plaques and tangles. A probable AD diagnosis is made when an individual meets certain criteria for cognitive decline. However, there is increasing evidence that AD pathology may begin decades before clinical symptoms appear. Studies done on APOE-ε4 carriers have shown deficits in odor processing before the development of AD. Additionally, studies using olfactory event-related potentials (OERPs) have been able to distinguish between APOE-ε4 carriers and non-carriers. Few studies have investigated the links between odor discrimination and AD and none to date have examined the relationship between odor discrimination and APOE-ε4. This study will examine OERPs in an odor discrimination task and compare those results to results from an analogous visual task. Participants will be recruited from the participant pool at the Lifespan Human Senses Laboratory at San Diego State University (SDSU) and the Psychology 101 Research Participant pool at SDSU. Participants will be separated into two age groups: young (18–28 years) and middle age (45–56 years). A screening session will take place before the testing day in order to determine APOE status and eligibility for participation. In a separate testing session, participants will be administered the discrimination tasks. Odor discrimination will be tested with a pairwise task in which participants will be presented with pairs of odors and must indicate whether the odors in a pair are the same or different. To control for deficits in working memory or generalized semantic memory, a color discrimination task will be also be administered. It is hypothesized that olfactory N2 and P3 amplitudes will differ in ε4+ individuals compared to ε4- individuals. It is also hypothesized that ε4+ individuals will show longer peak latencies, specifically for the olfactory N2 and P3 latencies than ε4- individuals.

Session G-7
Poster: Women’s Health
Friday, March 4, 2016, 4:00 – 5:30 pm
Montezuma Hall

610 Poster #33
Cultural and biological models of reproductive health among migrant women
Gabriela Avendano, Psychology (U)
Linda Abarbanell, Psychology

While the total fertility rate among Hispanics in the US has been steadily dropping, it remains higher than most other ethnic groups, with Hispanic-Americans having the highest rate of unintended births (CDC, 2015). Cultural factors including religion and familismo, a strong emphasis on family, are cited as contributing to these high birth rates. Low SES, education and English language skills may also limit women’s access to and choice of contraceptive methods and their effective and continued use. These factors are only amplified among migrant populations who face additional barriers due to their mobility and undocumented status; they may lack adequate social support and information networks and have difficulty navigating an unfamiliar healthcare system. One factor that is understudied in this context are the (mis)conceptions individuals hold regarding the body, reproduction and different contraceptive methods. Studies suggest Hispanic women have low levels of knowledge about reproduction and contraception (Garcés-Palacio et al., 2008), and are therefore more fearful about potential side effects (Gilliam et al., 2004; Guendelman et al., 2000). Moreover, a recent study of Mexican-American women at the El Paso border found they frequently misconstrued biological substances such as hormones in concrete terms with negative implications for oral contraceptive use (Sheldon et al., 2013). We therefore interviewed 5 migrant women temporarily residing in the Imperial Valley with the goal of understanding the relationship between structural factors, cultural beliefs and biological knowledge in this domain. Interviews were conducted in Spanish by researchers familiar with this population. We asked participants about their attitude towards and use of contraception and reproductive
health services and assessed their understanding of different methods, including the mechanisms of action, side-effects, and indications for use for both traditional (herbal, rhythm, withdrawal) and modern methods (IUD, hormonals, sterilization). Participants’ responses revealed a limited understanding of the biological mechanisms underlying contraception which appeared to be constrained by pre-existing cultural beliefs. In future work, we will explore how cultural and biological models are activated by specific structural and contextual factors. This work has important implications for education and outreach for reproductive health services addressing this and similar populations.

611 Poster #34
**Do Cognitions and Quality of Life Predict Resiliency Among Breast Cancer Patients?**
Bianca Ayscue, Psychology (U)
Terry Cronan, Psychology

Breast cancer accounts for 30% of all cancer diagnoses among American women, making it the most commonly diagnosed cancer among this demographic (U.S. Breast Cancer Statistics, 2014). A cancer diagnosis can cause a number of psychological problems, thereby lowering quality of life (Noyes & Kathol, 1985). Cognitive fusion has been shown to have major impact on the psychological well-being of women diagnosed with breast cancer (Soo & Sherman, 2015). Past research has shown that resilience correlates with positive physical and mental health (Loprinizi, Prasad, Schroeder, & Sood, 2011), therefore leading to greater quality of life. Another study found that quality of life has been shown to positively correlate directly with resilience (Nawaz, Malik, & Batool, 2014). The purpose of the main study was to investigate the effects of Acceptance and Commitment Therapy (ACT) on a sample of 32 women with a physician’s diagnosis of breast cancer, stages 0 to 3, who have completed curative surgery for their breast cancer, and who show at least moderate levels of distress. This study’s focus was to examine the correlational relationships between cognitive fusion and quality of life when predicting resilience. Quality of life, cognitive fusion, and resilience will be assessed using the Quality of Valued Life Questionnaire, Cognitive Fusion Questionnaire, and Conner & Davidsons Resilience Scale respectively. It was hypothesized that a high level of resilience will correlate with a high level of quality of life and a low level of cognitive fusion.

612 Poster #35
**Pregnant Women in Low-income Communities and Why Their health is Lower Than Those in High-income Communities**
Aaliyah Goodie, Public Health (U)
Antwanisha Alameen-Shavers, Africana Studies

When discussing health issues, there is an obvious and distinct separation of people in low-income and high-income communities. It has been shown that those who live in high-income communities have a greater chance of living a life with few adverse health conditions as compared to individuals living in lower income communities. With this being said, there are a variety of groups within low-income communities, one of those groups being pregnant women. While there are numerous studies that report there is a high rate of adverse health conditions in low-income communities, most studies do not investigate the factors that can contribute to the existing disparity. Additionally, there are even fewer studies that analyze the correlation between the health status of pregnant women and income. Through examination of previous studies and through an observational study of high-income communities and low-income communities, this study will look at differences between the two financial groups. This information will be used to further assess pregnant women in low-income communities and the health conditions linked to them. Most importantly, this study will look into reasons to why these women are suffering more adverse health conditions than those pregnant women living in higher income communities.

613 Poster #36
**Does Acceptance of Ones’ Condition and Level of Distress Predict Emotional Well-being Among Breast Cancer Patients?**
Heather Kirchhoff, Psychology (U)
Terry Cronan, Psychology

Breast cancer is the most commonly diagnosed cancer among American women, accounting for about 30% of all cancer diagnoses. Facing any kind of cancer diagnosis can cause anxiety, depression, and overall distress, thereby lowering quality of life. More than 32% of women diagnosed with breast cancer exhibit symptoms of distress, which interferes with the ability to cope and the treatment outcome. Despite this finding, less than 10% of patients with significant levels of distress are referred for psychosocial treatment resulting in increased health care costs and lower quality of life for the patient. Acceptance
Poster #37

Birth Outcomes: The role of protective factors and racial experiences reported as stressful by African American mothers during pregnancy.

Kristen Lacar, Psychology (U)
Antwanisha Alameen-Shavers, Africana Studies

African American women have higher rates of premature deliveries, infant mortalities, and infants with low birth weight when compared to other ethnicities. Past studies have indicated that stress during pregnancy is correlated with low birth weight and prematurity. Children who are born premature or with low birth weight often have lower IQ scores, academic difficulties, and health problems later in life. Past research findings have been inconclusive in sufficiently explaining why racial disparities in birth outcomes continue to persist, but there is evidence that racism experienced during the life course is a contributing factor to stress during pregnancy. The purpose of this study is to examine what racial factors African American women report as stressful during their pregnancy that could negatively contribute to birth outcome and to determine what factors may play a protective role against stress due to racial experiences. Eight to ten African American women will be interviewed and each interview will be recorded and transcribed. Participants are required to be 18 years of age or older and have given birth within the last 3 years. Interview responses will be examined to determine whether there are racial stressors or protective factors that have not been previously reported. Responses will be further examined for consistency and commonality with previously conducted research. Results are inconclusive at this time.

Poster #38

Chorioamnionitis and Vaginal Examinations in Labor

Unja Kim, Nursing (M)
Catherine Madani, Nursing

Background: Chorioamnionitis is an infection of the amnion and chorion, and of the amniotic fluid. It affects both women and newborns, and sequelae in women include postpartum hemorrhage, endometritis, and sepsis. In neonates, chorioamnionitis is one of the most frequent causes of infant illness and is associated with 20 to 40% of cases of early onset neonatal sepsis and pneumonia. Historically, two to four percent of term births have been complicated by chorioamnionitis. Therefore, chorioamnionitis is a serious and preventable issue that must be addressed in order to avoid the occurrence of negative outcomes for the mother and newborn. Chorioamnionitis usually occurs in the setting of membrane rupture and results from the migration of cervicovaginal bacteria into the uterus to infect the fetal membranes, placenta, amniotic fluid, and fetus). Other factors that contribute to the development of chorioamnionitis include maternal colonization with Group Beta Streptococcus (GBS), induction of labor, prolonged labor (>24 hours), prolonged rupture of membranes (>18 hours), vaginal exams, and the use of intrauterine pressure catheters. Vaginal exams have become an established part of routine intrapartum care. Fewer vaginal examinations are associated with a decreased rate of infection. More information is needed to assess why despite ample research and clinical practice guidelines, health care providers (physicians and registered nurses) continue to perform frequent vaginal exams. Objective: The purpose of this study is to evaluate current knowledge, attitudes and practices of healthcare providers regarding vaginal exams and chorioamnionitis. Methods: Seventy-eight registered nurses in labor and delivery at three San Diego hospitals completed written surveys assessing demographics, personality type, and attitudes towards and practices when caring for laboring patients—including vaginal exam frequency. Results: Data analysis underway. Conclusions: Data analysis underway.
Session G-8  
**Poster: Water Biology**  
Friday, March 4, 2016, 4:00 – 5:30 pm  
Montezuma Hall

**616  Poster #39**  
*The invasive alga, Sargassum horneri, threatens coastal ecosystem function in San Diego*  
Genoa Sullaway, Ecology (M)  
Matt Edwards, Ecology  

Species introductions and the subsequent displacement of native species can negatively impact community assemblages and alter ecosystem functioning across a wide range of habitats. Macroalgae, in particular, are common marine invaders due to their microscopic life stages, which are easily transported long distances in ballast water and/or associated with floating debris. In southern California, the annual brown alga *Sargassum horneri* has invaded kelp forest habitats, which are extremely productive ecosystems that support a diverse community of organisms. Here, measurements of algae diversity and algae primary production are used to estimate the effects of *S. horneri* on ecosystem function in southern California.

I expected that the invasion would decrease algae assemblage diversity, resulting in a decrease of associated primary production in the impacted ecosystem. In order to test this hypothesis, algae assemblages were surveyed on SCUBA in invaded and non-invaded sites in La Jolla, San Diego County. To assess photosynthetic capabilities of individual algae species, 5 species were collected from each site in La Jolla and incubated in the lab to create photosynthetic irradiance curves (P-I curves). P-I curves were constructed by exposing algae to progressively higher irradiance levels every 60 minutes, and measuring photosynthetic carbon uptake after exposure to each light level.

I found that non-invaded sites have diverse algae assemblages that are able to take advantage of a broad array of light levels (i.e., natural daily fluctuation). In contrast, I found that invaded sites had lower algae diversity, which appears to impact light utilization of the assemblage as a whole. Species present in these invaded habitats photosynthesized more rapidly in high light conditions than in low light conditions. In keeping with this trend, the invasive *S. horneri* exhibits a relatively high photosynthetic rate under high light levels, indicating high productivity in those conditions.

Further experiments will indicate if the short-term increase in ecosystem production caused by this invasive species can compensate for decreases associated with a less diverse algae assemblage. However, these results indicate that *S. horneri* is indeed threatening kelp forest ecosystem functioning and resilience in San Diego.

**617  Poster #40**  
*Genomic characterization of four novel bacterial species isolated form Point Loma, San Diego*  
Kristen Aguinaldo, Biology (M)  
Elizabeth Dinsdale, Biology  

Over 650 bacterial isolates were collected the surface of *Macrocystis pyrifera* beds across the southern California coastline. Across three sampling sites (Catalina island, Point Loma and La Jolla), four novel bacteria species were discovered exclusively from Point Loma, San Diego. Our research aims to functionally characterize the genomic content of the four bacterial strains ED522, ED523, ED524 and ED575. Based on the 16s rRNA gene sequence, the four strains matched closest to *Rhodobacteraceae* family belonging to the *Alphaproteobacter* class. Specifically, ED522 and ED523 exhibited the highest similarly of the 16s rRNA gene sequence to a *Sulfitobacter donghicola* strain. Similarly, ED524 and ED575 showed high similarity to *Ascidiaeihabitans donghaensis* strain. The genome size of the four novel species ranged from 3.6 million bp to 4.7 million bp, with a G+C content spanning from 55.1 % to 57.3 %, also containing 3,3,634 to 4,927 protein-encoding genes. According to the RAST annotation, ~ 2 % of their total genome contributes to virulence, disease and defense, of which the majority of these genes are responsible for resistance to antibiotics and toxic compounds. For example, the four novel bacteria strains show the presence of the Mercuric ion reductase (EC 1.16.1.1), commonly known as the merA. The merA is critically important for converting toxic mercury into their elemental form (reducing Hg$^{2+}$ to Hg$^{0}$). Future studies will investigate spatial patterns or identify other bacterial species that contain merA. In addition, determine if the presence of merA is indicative of elevated mercury concentrations in Point Loma. This research will continue to characterize the novel bacteria to identifying or understanding key factors that can potentially explain the existence of these bacterial strains exclusively on the surface of *M. pyrjeta* in Point Loma.
**Poster #41**

*Characterization of E. coli in recreational waters of Sayulita, Mexico and possible implications for human and marine ecosystem health*

Susana Najera, Cell and Molecular Biology/Spanish (U)  
Katherine Comer Santos, Geography

The principal objective of this research was to test for the presence of *Escherichia coli* (*E. coli*) in recreational waters of Sayulita, Nayarit, Mexico over a period of seven weeks in 2014 and again in 2015. Four interns in The Science Exchange Program collected water samples from five different areas in the drainages and ocean. They utilized the IDEXX Colilert-18 predispensed MPN procedure to quantify the levels of E.Coli and determine if samples exceeded the Mexican government’s recommended limit for recreational waters (>200 MPN/100mL). Of the 28 ocean samples taken, 32% exceeded the government limit with an average of 280MPN/100mL. Likely sources of pollution are from two drainages with illegal storm water and sewer connections. From the 42 drainage samples we found 69% exceeded the government limit with a mean of 6,021 MPN/100mL. Through health interviews and surveys I implemented at local clinics in 2015, there were 30 cases of gastrointestinal or other illnesses, and although 52% of patients reported recent swimming in the ocean, it is not possible to rule out other factors. Lower water temperatures were significantly correlated to higher E. Coli MPN levels (n=62, Spearman’s R= -0.56; p<0.001), a trend that could help future sampling strategies. More water quality sampling and a beach posting program needs to be implemented at this internationally popular surfing, fishing, and swimming spot. Low cost citizen science methods such as those used in this study could be replicated by locals.

**Poster #42**

*A Longitudinal Survey for Phage-encoded Toxin Genes in the Sewage-impacted Environment Along the San Diego Coast*

Tess Condeff, Biology (U)  
Stanley Maloy, Biology

It is not uncommon for public beaches along San Diego’s coastline to be closed after rain due to contamination. Sources of contamination include untreated sewage flowing from the Tijuana River and urban runoff from throughout San Diego. *Escherichia coli*, known to carry the phage-encoded shiga toxin gene (*stx*), is commonly found in human and animal feces and is a known human pathogen. We were interested in investigating and comparing the presence of *stx* in sewage-impacted areas along the San Diego coast during the dry and rainy seasons. From 2007–2015, sediment and water samples from the Tijuana River National Estuarine Research Reserve (TRNERR) and neighboring Imperial Beach were collected and screened via molecular assays for *stx*. Sediment and water samples from both locations frequently tested positive for *stx*. Overall, *stx* was detected in 78% of all samples. The *stx* gene was detected most frequently in samples collected from the area most highly impacted by sewage input—the estuary. The *stx* gene was detected more frequently in water samples from the estuary (90%), versus sediment samples, and vice versa for the Imperial Beach samples (82% in sediment vs. water). Comparing samples collected in the rainy season (October through March) versus the dry season (April through August), *stx* was detected most in the rainy season samples, with the greatest number detected in the samples from the estuary. No detectable variation in *stx* gene frequency was observed between samples collected from 2007 to 2015. Overall, the data indicates an increased presence of phage-encoded *stx* in the highly sewage-impacted area of the Tijuana River Estuary during the rainy season when local and international wastewater treatment is insufficient at treating the influx of raw sewage after heavy rains. Phage are highly mobile genetic elements and when they carry virulence genes such as *stx*, the transfer of these genes to new bacteria could lead to the evolution of novel human pathogens. It is therefore important to continue to monitor these impacted environments for phage-encoded genes, especially during the rainy season.

**Poster #43**

*Balboa Park Water Project*

Morgan Faber, Environmental Science (U)  
Matthew Rahn, Environmental Science

Balboa Park provides many forms of entertainment and attraction through its vast open spaces, museums and other amenities that it offers. As a result, it is a main attraction for tourists and residents alike and brings major economic as well as ecological services to the city of San Diego. Balboa Park is decorated with water intensive vegetation and there is a prolonged drought occurring in San Diego. There are also areas where the current vegetation would provide more aesthetic and touristic benefits if they were replaced with vegetation that is less water demanding. In order to help alleviate the water demand from the park, the amount of water that would be saved by switching to more native and drought tolerant vegetation was assessed. The mapping of different vegetation types was established by the means of Geographic Information Systems (GIS). The areas where potential areas of re-vegetation were established and a list of plant and tree species that will use less water was compiled. As a result of completing the above procedure, it was found that Balboa Park would save a tremendous amount of water by switching its vegetation to more drought resistant vegetation and would also help save vast amounts of money as a result. Furthermore the results showed that the park would become more aesthetically enhanced and therefore would bring more economic growth to the park. This project will be able to be used as a tool for further enhancing and creating more economic growth for the park.
621 Poster #44
Leaf Area Index of Drought Years and El Nino Precipitation Events Impacts Southern California Native and Non-Native Plants
Brenda Garcia, Environmental Science (U)
David Lipson, Biology
Southern California is experiencing extreme weather events. Precipitation changes as part of global climate change may contribute to the spread of exotic annual plants over native shrubs. Santa Margarita Ecological Reserve (SMER), a California protected site, is dominated with native coastal sage scrub and California chaparral vegetation, along with non-native plants. Vegetation recovery may be measured from leaf area index (LAI) and soil nitrogen as predictors of plant response to climate change. I hypothesized that native species will tolerate drought conditions more than exotic annuals as native perennial shrubs have deeper roots. El Nino rain events increase soil water content, which may travel to deeper soil levels containing nutrients, like nitrogen, I predict that increased nitrogen concentrations at lower soil depth will benefit the native perennial shrubs. Methods: Leaf area index is the total one sided area that transpires water and carbon dioxide through stomata. To measure LAI a remote sensing approach were used from the Normalized Vegetation Index (NDVI) equation derived from near infrared radiation (NIR) and the red (R) region of spectral reflectance in the electromagnetic spectrum as green is highly reflected. Soil ammonium and nitrate concentrations were measured using soil samples from 30 plots part of the SDSU SMER Rainfall Manipulation Experiment using colorimetric assay. Results: Measurements of NDVI during antecedent precipitation conditions (APC) of drought years have been gathered and will be compared to measurements of NDVI after El Nino precipitation events. It is predicted that ammonium and nitrate nutrients will be higher as a consequence of El Nino event and will impact the growth of native perennial shrubs. Conclusion: The NDVI measurements will differ from previous years with the success of exotic annuals. Overall this study helps understand the recovery times of native shrubs and compare this to invasive annuals and understand the impacts that global climate change has on vegetation.

622 Poster #45
Aerodynamic effects on flame spread and extinction
Luca Carmignani, Mechanical Engineering (D)
Subrata Bhattacharjee, Mechanical Engineering
Flame-spread over solid fuels in presence of an opposed flow field has received increasing attention over the last forty years, due to its implications in fire safety and combustion of solid propellants. The opposing flow can be due to a buoyancy-induced flow, forced flow, or a combination of them. A vertical wind tunnel was used to generate flow velocities in the range of 0-100 cm/s, against which a laminar flame spread along the fuel sample. In this work the influence of the boundary layer over the sample on the flame-spread rate has been experimentally investigated using cellulosic fuel (filter paper) and pmMA; results show that the actual velocity seen by the flame embedded in the boundary layer (called equivalent velocity) leads to a decreasing spread rate while the flame is going downward, even for constant free stream velocities. This behavior can be justified relating the residence time to the equivalent velocity; thus the flame enters in the kinetic regime before expected, eventually causing local blow-offs and the complete extinction of the flame. The distance from the sample edge to the point where extinction occurred increased with higher flow velocities, suggesting that extinction could be determined by a critical equivalent velocity; an easy-to-use formula has been proposed accordingly with results for both fuels, in order to predict the length over the sample at which extinction occurs knowing the free stream velocity.

623 Poster #46
Microgravity Combustion and Flame Spread along Narrow Vertical Channel and on Vertical Plates
Martin Saitta, Mechanical Engineering (M)
Fletcher Miller, Mechanical Engineering
The study addresses the effects of buoyancy on flame spread by comparing normal gravity with microgravity conditions. Previous studies by Ghaleb Hamdan, Karen Hung, and Garrett Bornand have explored the combustion of fuel samples and spread of flames in the horizontal direction. Those studies disregarded the effects of buoyancy in order to simulate microgravity conditions. Guarav Patel studied the propagation of flames in the downward direction in the presence of forced convection. This study addresses the spread of flames in the downward direction due...
Inlet and outlet temperatures of the air. Each vessel is equipped with thermocouples, positioned to read the temperature at 5 atmospheres of pressure. The replica will be used to evaluate the validity of any computational model of the MATESS. To improve on this simulation, I have implemented a UDF to be incorporated in the FLUENT model that will use the enthalpy method of thermal storage to simulate the PCM characteristics. In this presentation the preliminary results of the enthalpy method for thermal storage with repeated cycling as well as the construction of the lab-scale replica are presented.

625 Poster #48

**Numerical simulation of convective cooling by a wall jet along a convex surface**

Keyu Dhingani, Mechanical Engineering (M)
Fletcher Miller, Mechanical Engineering

There has been a tremendous research going on to harness the renewable resources because of the decline in fossil fuels, its effect on the global climate and a demand to search for new clean and green energy resource. One such research has been conducted at Combustion and Solar Energy Laboratory (CSEL) to harness the Solar Energy by using a Small Particle Heat Exchange Receiver (SPHER). SPHER uses the carbon nanoparticles to absorb the solar radiation which is concentrated using the mirrors that reflect the solar radiation towards the SPHER dome through the dome window. A Brayton cycle is run using this heat air suspension particles to produce valuable electricity.

Stefan Tveit, Mechanical Engineering (M)

The temperature inside the Small Particle Heat Exchange Receiver can exceed 1000°C which can cause structural damage to the dome window, that is made up of glass. The dome window on the receiver must be kept below 800°C, however, in order to prevent long term damage to the glass. The goal of this research is to numerically simulate and analyze the convective cooling of a dome window by using an internal jet flow over it. The simulations are based on an experimental setup which has 8 nozzles for the jet flow over the dome window. Initially, a 2D model is set up and only turbulent module is added. Only 2 nozzles are activated for the 2D model. The jet...
flow through these nozzles are pulsated as well as its velocities are varied to see the effects of separation of the jet flow from the dome window. Nozzle size may also be varied to adjust the turbulent behavior of the jet flow. The behavior of jet flow is studied for Steady state as well as Transient state cases. The simulations for this research are done in the Ansys Fluent and modeling in SolidWorks. Further research work includes adding a Heat Transfer module to study the convective cooling as well as radiative effects on the SPHER window and pulsating all the 8 nozzles to get the cooling all over the window.

**626  Poster #49**

*Computational Modeling using Fire Dynamics Simulator to Replicate the Burning of Thermally Thick Polymethyl Methacrylate in a Narrow Channel Apparatus*

Nicholas Lage, Mechanical Engineering (M)
Fletcher Miller, Mechanical Engineering

The San Diego State University (SDSU) Narrow Channel Apparatus (NCA) has been proven through comparison with the previous flame spread studies in the Microgravity Science Glovebox (MSG) experiments conducted on the International Space Station (ISS) to emulate microgravity flow conditions. The NCA replicates microgravity by flowing of mixtures of nitrogen and oxygen through a narrow gap in order to suppress buoyancy above the burning sample.

Using Fire Dynamics Simulator (FDS), I have developed a model of thermally thick samples of polymethyl methacrylate (pmMA) that are burned in the NCA. A domain used of 40 mm by 5.3 mm was used with the assumption that the inlet velocity is a laminar, parabolic, fully-developed flow. Since the flow is assumed laminar, direct numerical simulation (DNS) is used. The combustion is modeled using a complex pyrolysis model that simulates the decomposition of pmMA into methyl methacrylate (MMA) vapor and the reaction of the MMA vapor with oxygen using a second-order, single step Arrhenius rate gas-phase reaction assuming complete combustion.

This research is still ongoing, and I will vary different parameters, such as oxygen concentration, inlet flow velocity and sample thickness, and I will compare the results with previous studies that have been made.

**627  Poster #50**

*Natural Convective Cooling in Small Homes in Semi-Arid Climate Zones using a Thermal Chimney and Underground Air Intake Design*

Jovana Poduje, Mechanical Engineering (M)
Fletcher Miller, Mechanical Engineering

The aim of a passive cooling system is to eliminate the high costs of the air conditioning system and reduce carbon emissions. This research explores an integrated thermal chimney and underground air intake design used as a non-mechanical method of cooling in semi-arid climate zones. The structure utilizes metal as the material for the roof and the chimney in one cohesive design. An air gap is integrated under the steel roof to create a pocket of hot air which creates a density differential in the interior of the home and draws the cool air entering the living space upwards and out the thermal chimney. The underground air inlet system cools the air to ground temperature by forced convection before it is drawn into the interior of the structure, thus eliminating the need for a mechanical cooling system.

Various geometries and temperature gradients are analyzed using Fire Dynamics Simulator (FDS) software to optimize the integrated natural cooling system. FDS is a computational fluid dynamics (CFD) software used for low-speed, thermally driven flows. This integrated system is considered optimized when the interior of the structure reaches a comfortable steady state temperature for the building inhabitants. The underground air inlet line is at a depth of eight to ten feet, where soil temperatures remain at a constant 65 degrees year round. In current simulations the air achieves cooling temperatures around 72 degrees. The heated thermal chimney exit slowly draws the cool air upward to the chimney exit. Slow mixing occurs throughout the interior of the structure as the air rises until it reaches fully mixed steady state.

This research explores three cases for the ratio of the geometry duct to the chimney, as well as the size of the air gap in the roof and varied roof pitches. Once the geometries have been optimized, industry materials will be implemented to improve practicality and reduce the cost of construction.
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